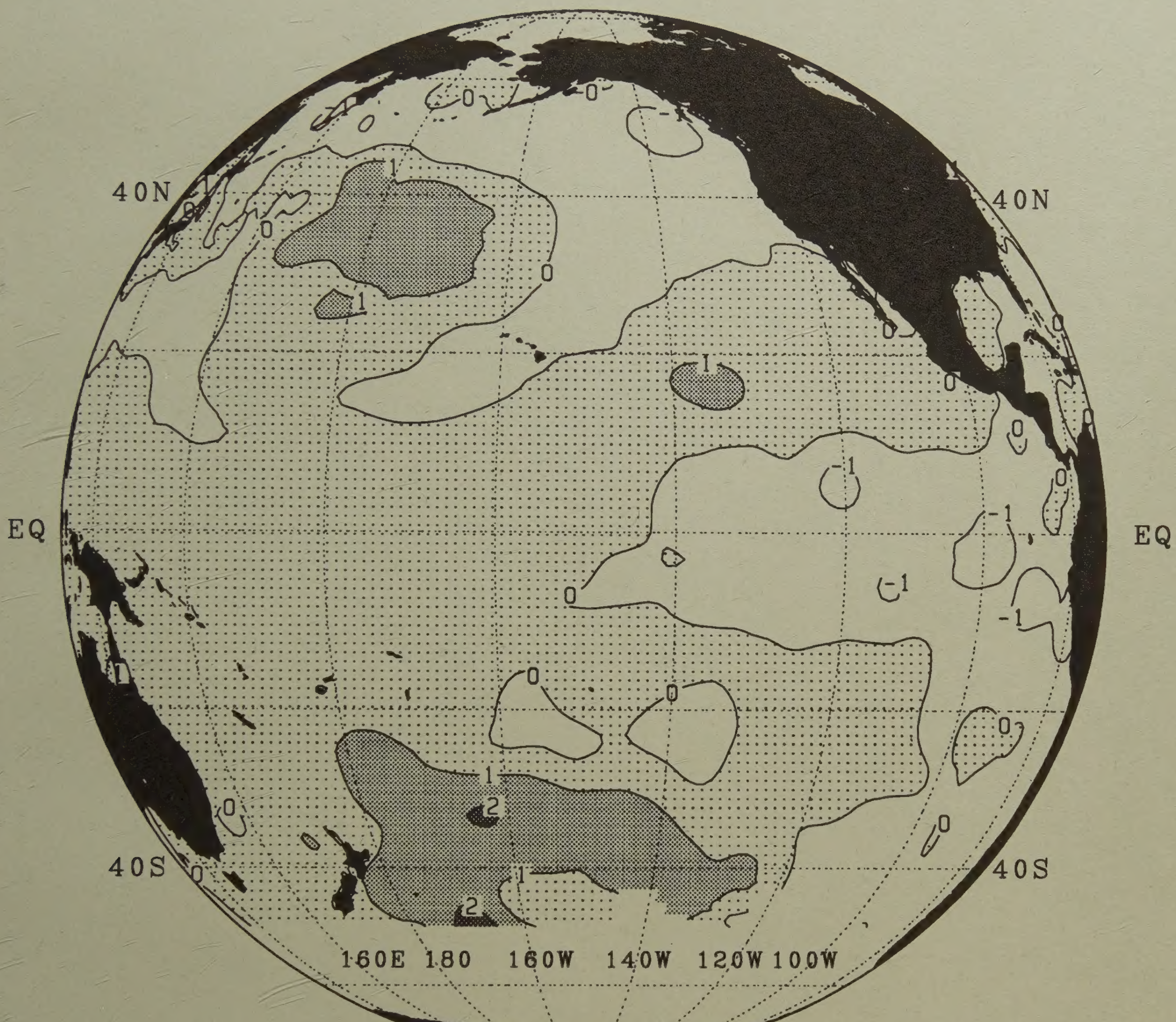
気象庁海洋月報

Monthly Ocean Report
November 2001 (No. 107)



Climate and Marine Department
Japan Meteorological Agency

気象庁 気候・海洋気象部

平成13年11月

気象庁海洋月報は、気象庁 気候・海洋気象部 海洋気象情報室で作成しています。
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Monthly Ocean Report is prepared by the Office of Marine Prediction, Climate and Marine Department, Japan Meteorological Agency.

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表紙は、2001 年 11 月の太平洋の月平均海面水温偏差図です。
陰影部は、平年より高温の海域を示しています。

The figure on the front cover shows the monthly mean SST anomalies for November 2001 in the Pacific Ocean.
Areas of positive anomalies are shaded.

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海況の特徴（２００１年１１月）

日本近海の海況

海面水温は、オホーツク海から北海道の太平洋岸、東海沖、及び20°Nから30°Nにかけての日本の南で平年より低かった。一方、常磐沖と日本海中部及び北部には１℃を超える正偏差が見られた（第４図）。

黒潮は東海沖で離岸し、33°N、140°E付近まで東に流れた後、上旬は南東に蛇行し、房総半島に沿って北上、中旬は東北東に流れた後、常磐沖を北上していた。下旬は32.5°N、141°E付近で北上、房総半島沖で東に蛇行した後、常磐沖を北東に流れていた（第９図）。

太平洋の海況

太平洋赤道域の海面水温は、140°Eから日付変更線にかけてと160°W付近で平年より0.5℃以上高かった。一方、140°Wから90°Wにかけては平年より0.5℃以上低く、100°W付近とペルー沖では－1℃を超える負偏差が見られた。

北太平洋の海面水温は、25°Nから45°Nの165°Eから165°Wにかけて平年より1℃以上高かった。一方、オホーツク海北部からカムチャツカ半島の東とアラスカ湾から30°N以北の北米沖にかけては平年より0.5℃以上低く、50°N、135°W付近には－1℃を超える負偏差が見られた（第１７図）。

Highlights November 2001

Seas adjacent to Japan

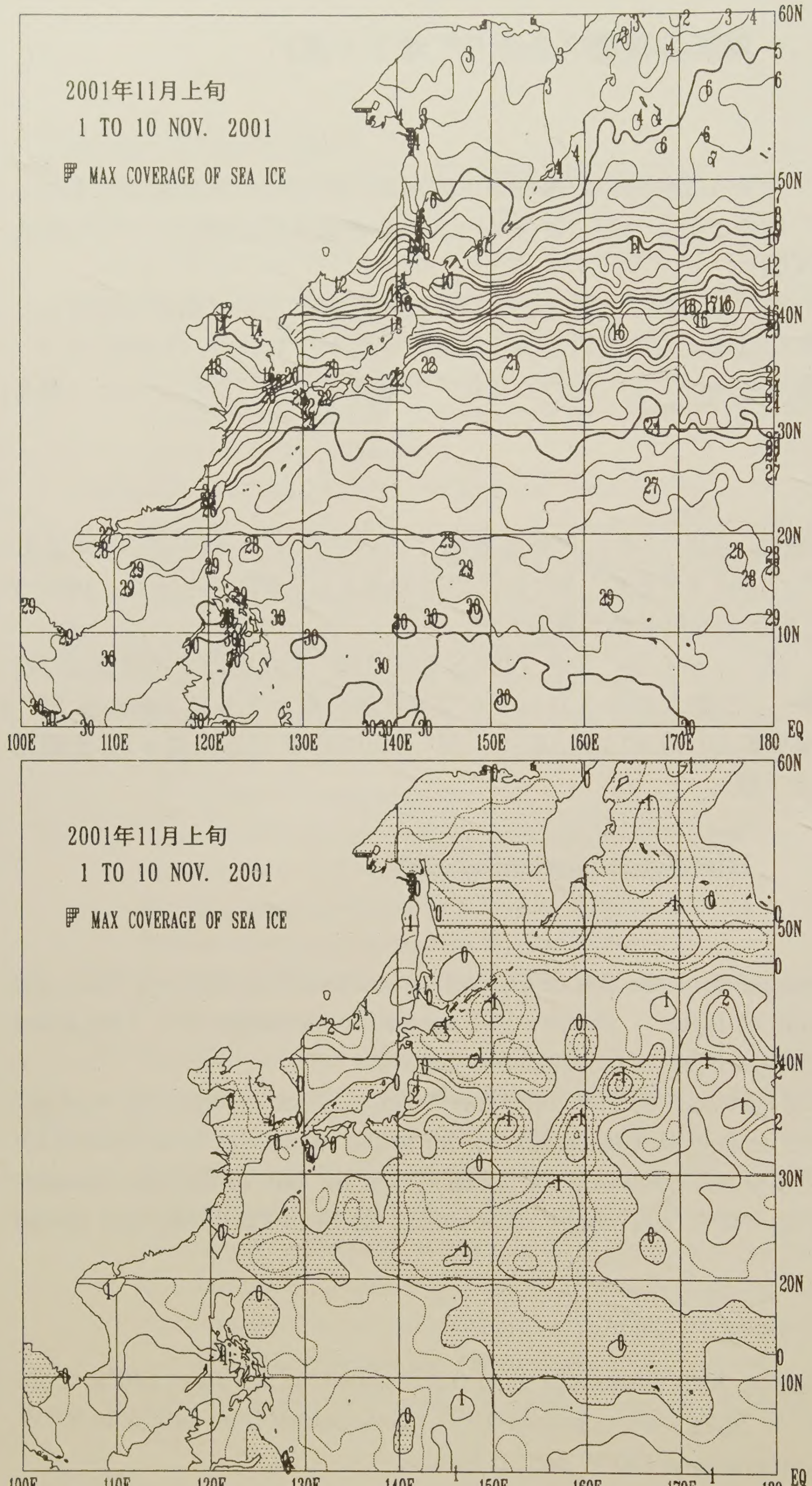
SSTs were below normal from the Sea of Okhotsk to south of Hokkaido, off Tokai and between 20°N and 30°N south of Japan. Positive SST anomalies exceeding +1℃ were found off Joban, in the central and northern part of the Japan Sea (Fig. 4).

The Kuroshio flowed eastward to 33°N, 140°E off Tokai. Then it looped SE-ward and flowed northward along the Boso Peninsula in the first 10-day of the month. In the second 10-day, it flowed ENE-ward and turned northward off Joban. In the last 10-day, the Kuroshio turned northward near 32.5°N, 141°E, and looped eastward off the Boso Peninsula, then flowed NE-ward off Joban (Fig. 9).

Pacific Ocean

In the equatorial Pacific, SSTs were more than 0.5℃ above normal from 140°E to the date line and around 160°W. SSTs were more than 0.5℃ below normal from 140°W to 90°W, and more than 1℃ below normal around 100°W and off Peru.

In the North Pacific, SSTs were more than 1℃ above normal from 165°E to 165°W between 25°N and 45°N. Negative SST anomalies exceeding -0.5℃ were found from the northern part of the Sea of Okhotsk to east of the Kamchatka Peninsula and from the Gulf of Alaska to the seas off North America month of 30°N. Negative SST anomalies exceeding -1℃ were found around 50°N, 135°W (Fig. 17).



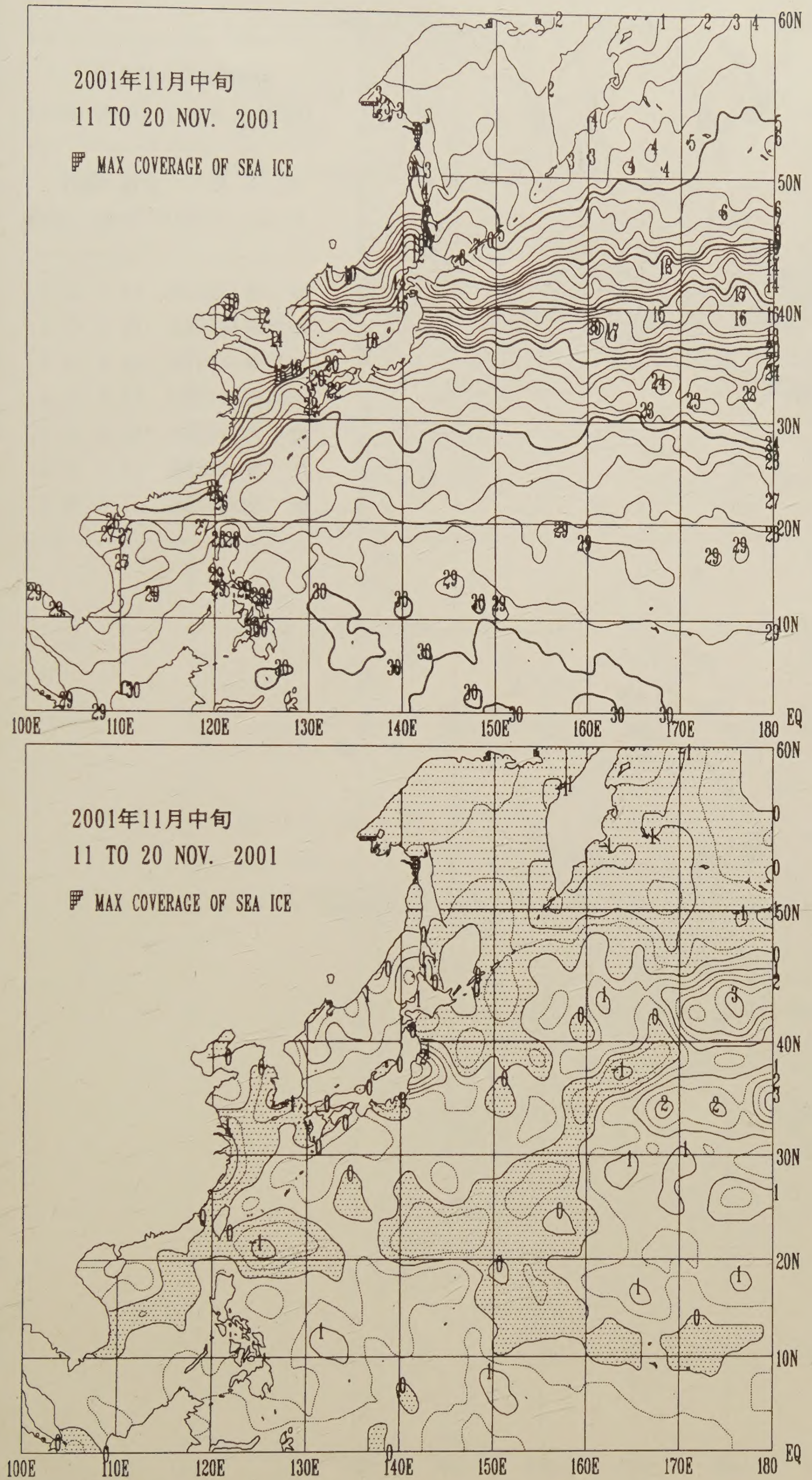
旬平均沿岸水温(℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石垣(47918)	25.9	0.6
御前崎(47655)	19.2	0.3
八丈島(47678)	23.4	1.0
小名浜(47598)	17.1	-0.4
宮古(47585)	15.9	-0.1
江差(47428)	14.9	0.9
浜田(47755)	19.6	0.1

第1図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(2001年11月上旬)

Fig. 1 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 1st ten-day period in NOV 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

Ten-day mean SST & Anomalies



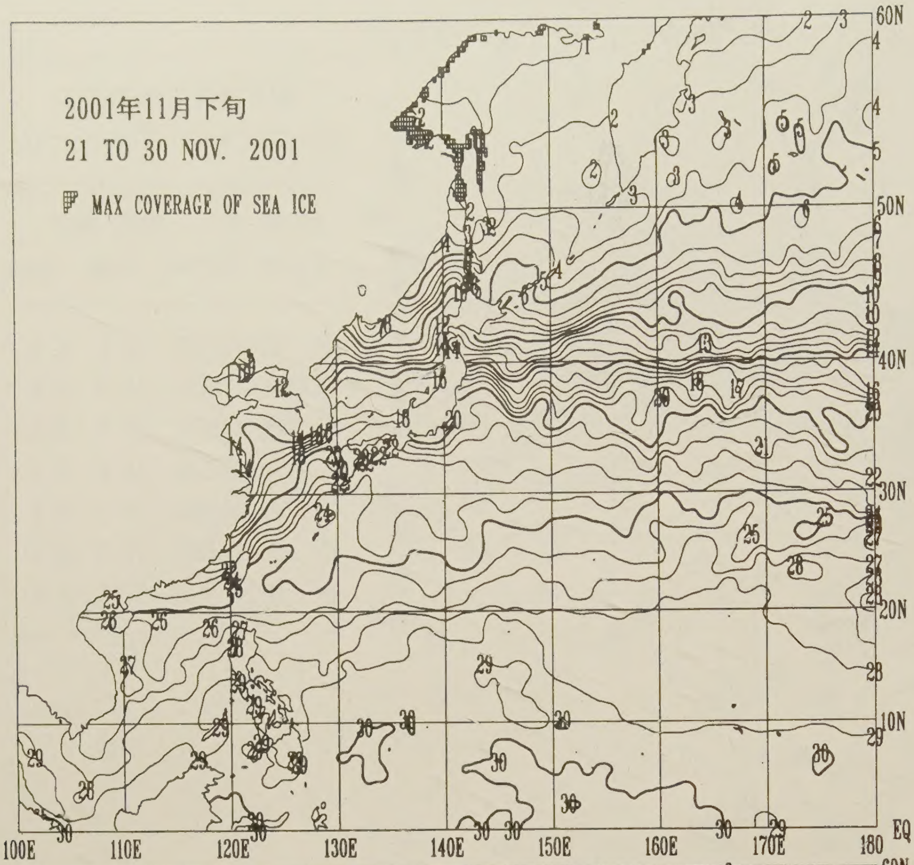
旬平均沿岸水温(℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	24.5	-0.1
御前崎(47655)	16.9	-0.6
八丈島(47678)	20.8	-0.9
小名浜(47598)	18.6	2.2
宮　古(47585)	14.7	-0.3
江　差(47428)	12.0	-0.2
浜　田(47755)	17.8	-0.8

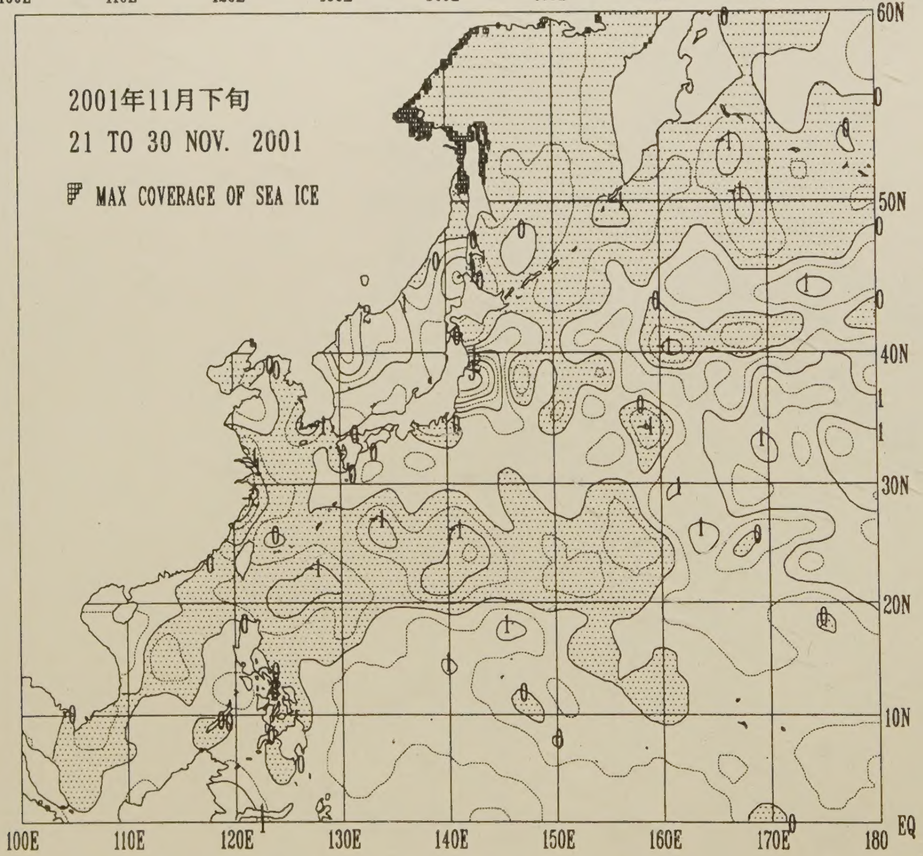
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Ten-day mean SST & Anomalies

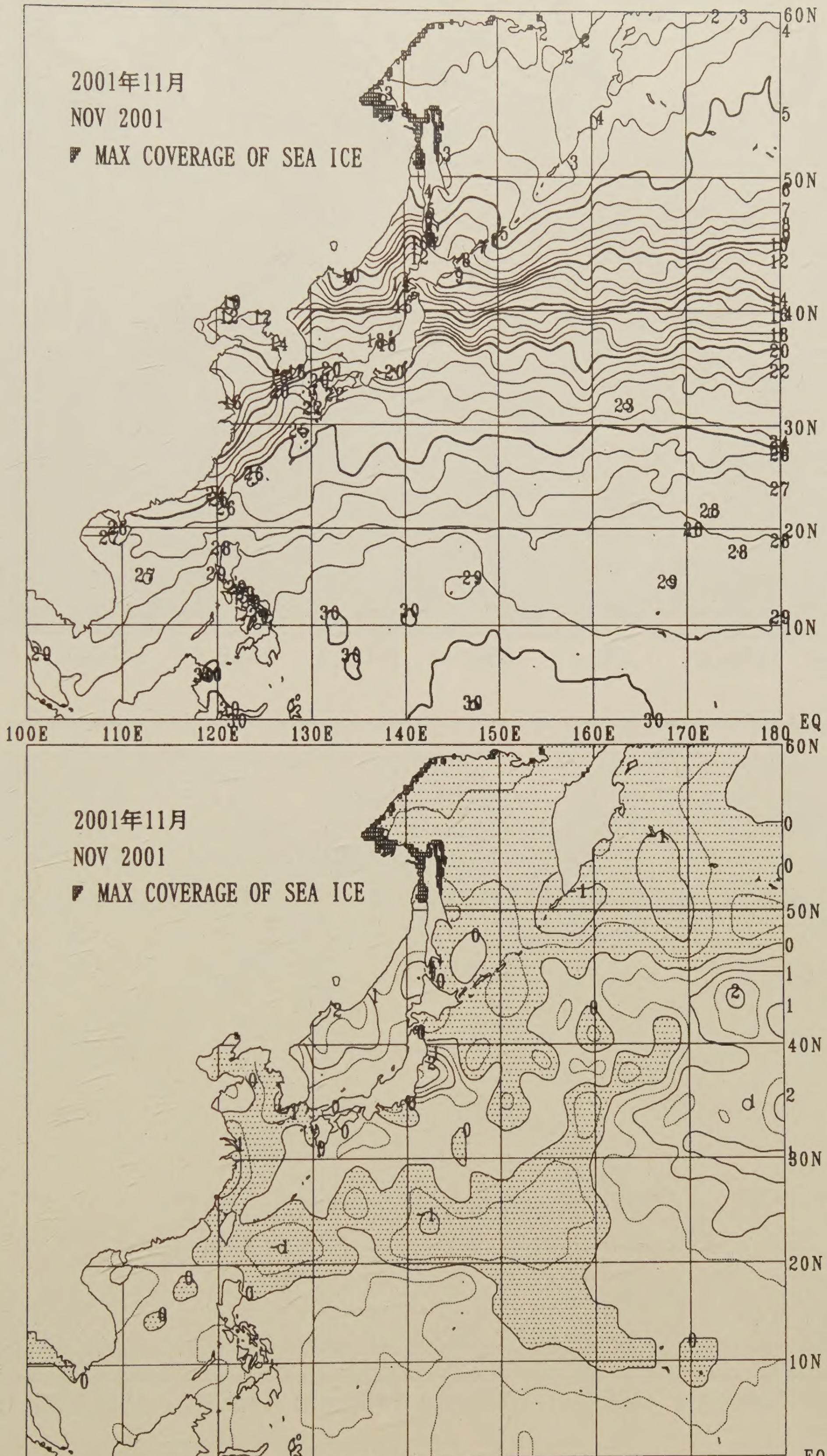


旬平均沿岸水温(℃) Coastal Water Temperature		
地 点 名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	23.7	0.1
御前崎(47655)	15.5	-0.6
八丈島(47678)	20.4	-0.4
小名浜(47598)	17.7	2.4
宮　古(47585)	14.0	0.1
江　差(47428)	12.1	1.3
浜　田(47755)	17.6	0.2



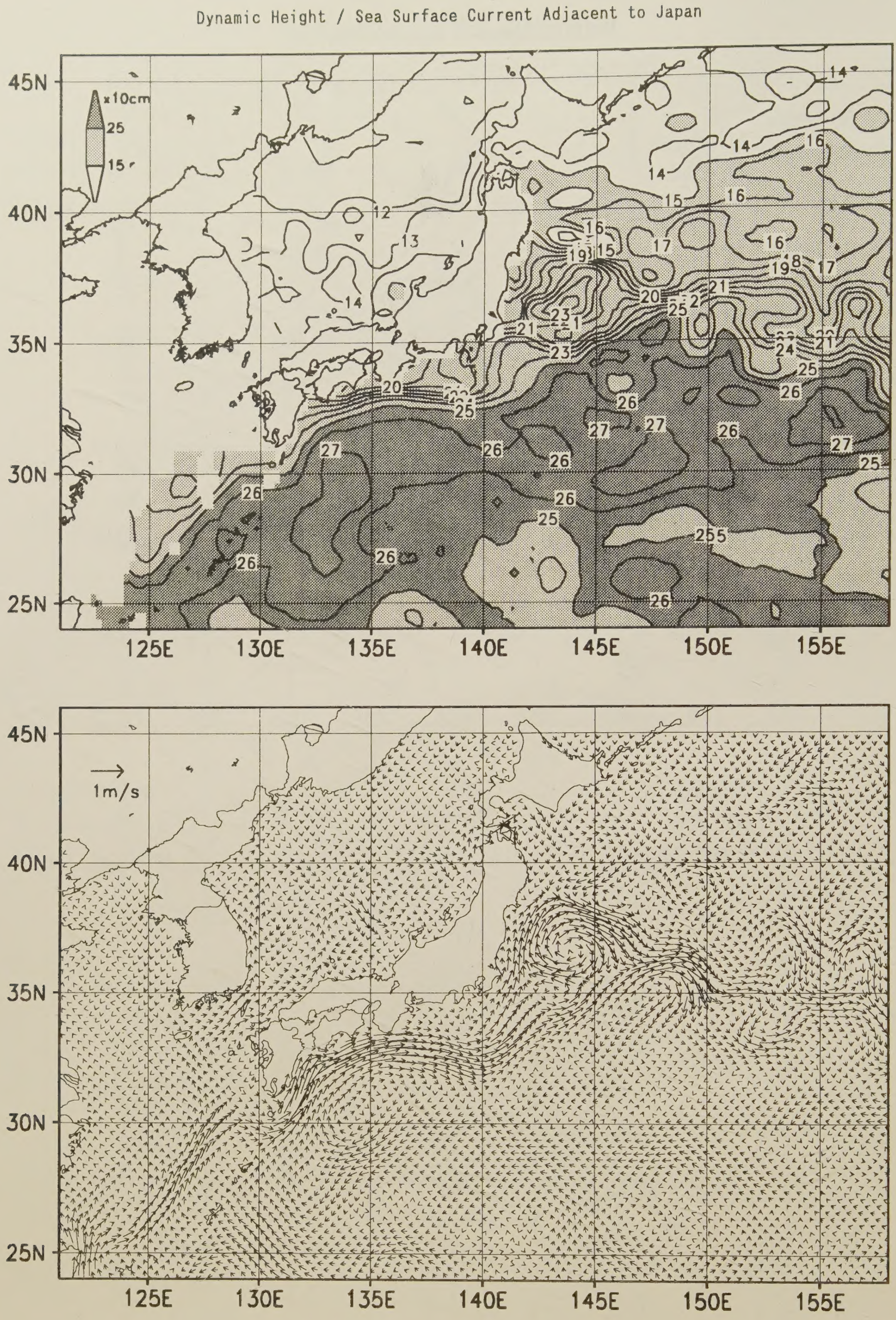
第3図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(2001年11月下旬)

Fig.3 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 3rd ten-day period in NOV 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



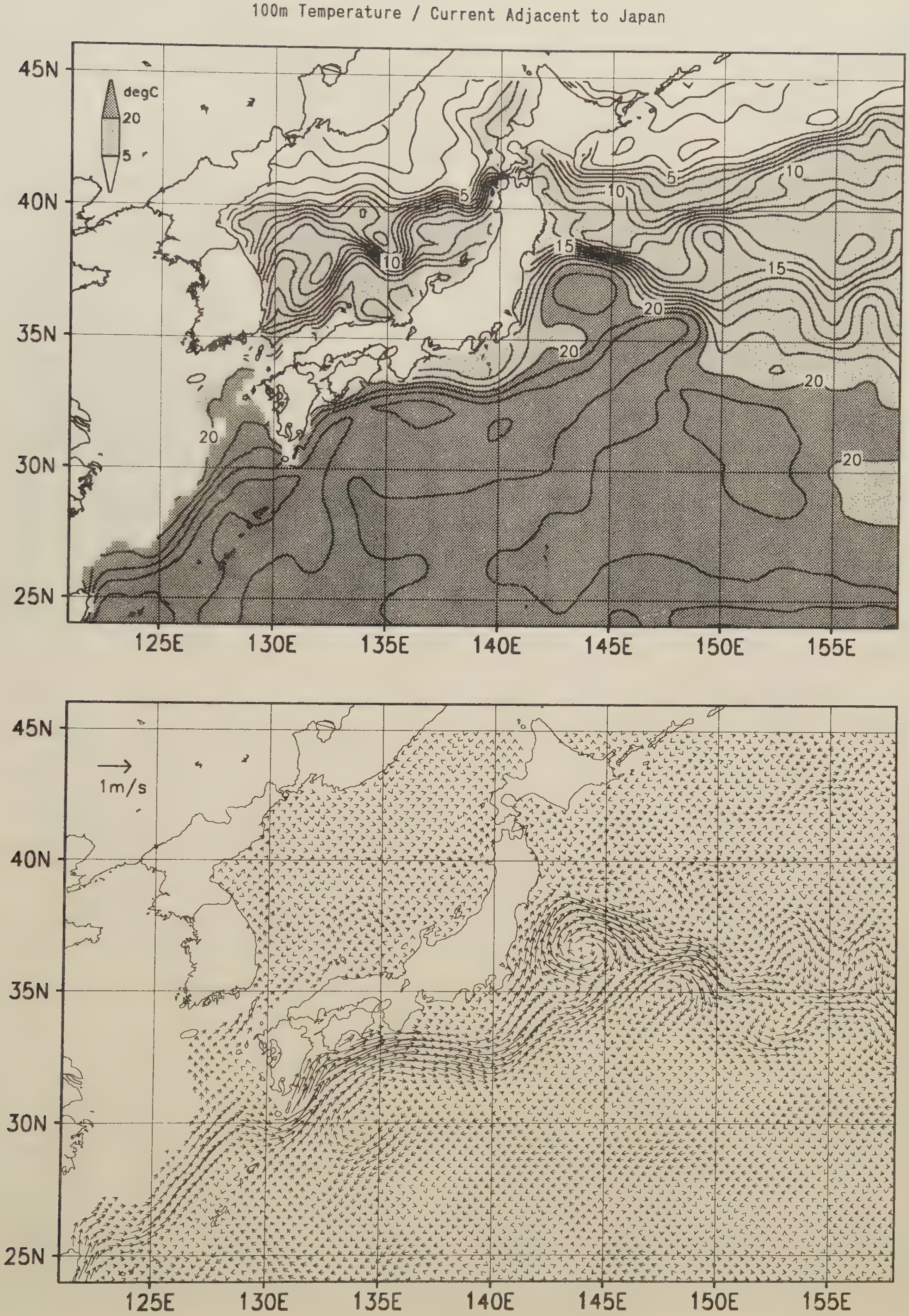
第4図 北西太平洋月平均海面水温図(上)及び偏差図(下) (2001年11月)

Fig. 4 Monthly mean SST (top) and anomalies (bottom) in the western North Pacific for NOV 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



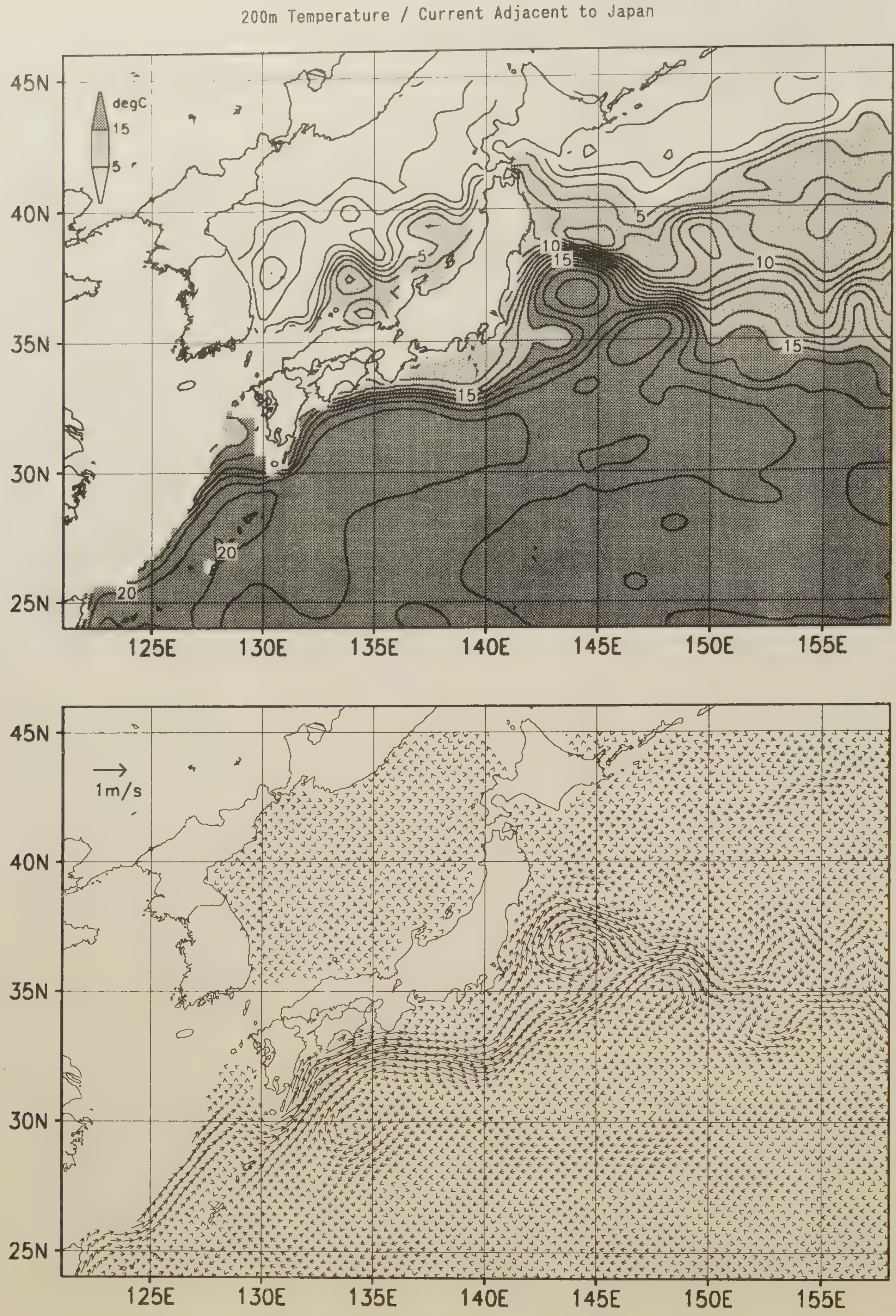
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(海洋総合解析システムによる)

Fig. 5　Monthly mean sea surface height (top) and current (bottom) in seas adjacent to Japan for November 2001. Contour interval is 10cm (top). (calculated by the Ocean Comprehensive Analysis System)



第6図　日本近海月平均表層水温図（上）と表層海流図（下）（深さ 100 m）（2001 年 11 月）
（海洋総合解析システムによる）

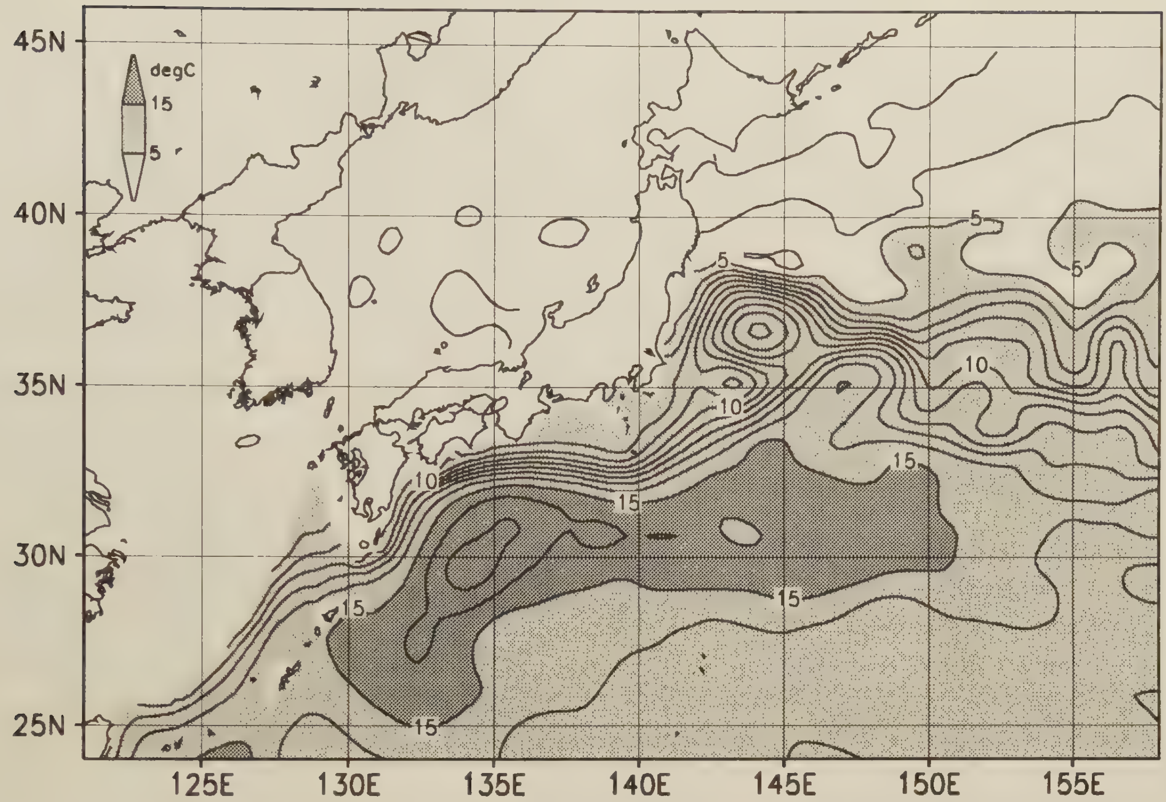
Fig. 6　Monthly mean subsurface (100 m) temperature (top) and current (bottom) in seas adjacent to Japan for November 2001. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)

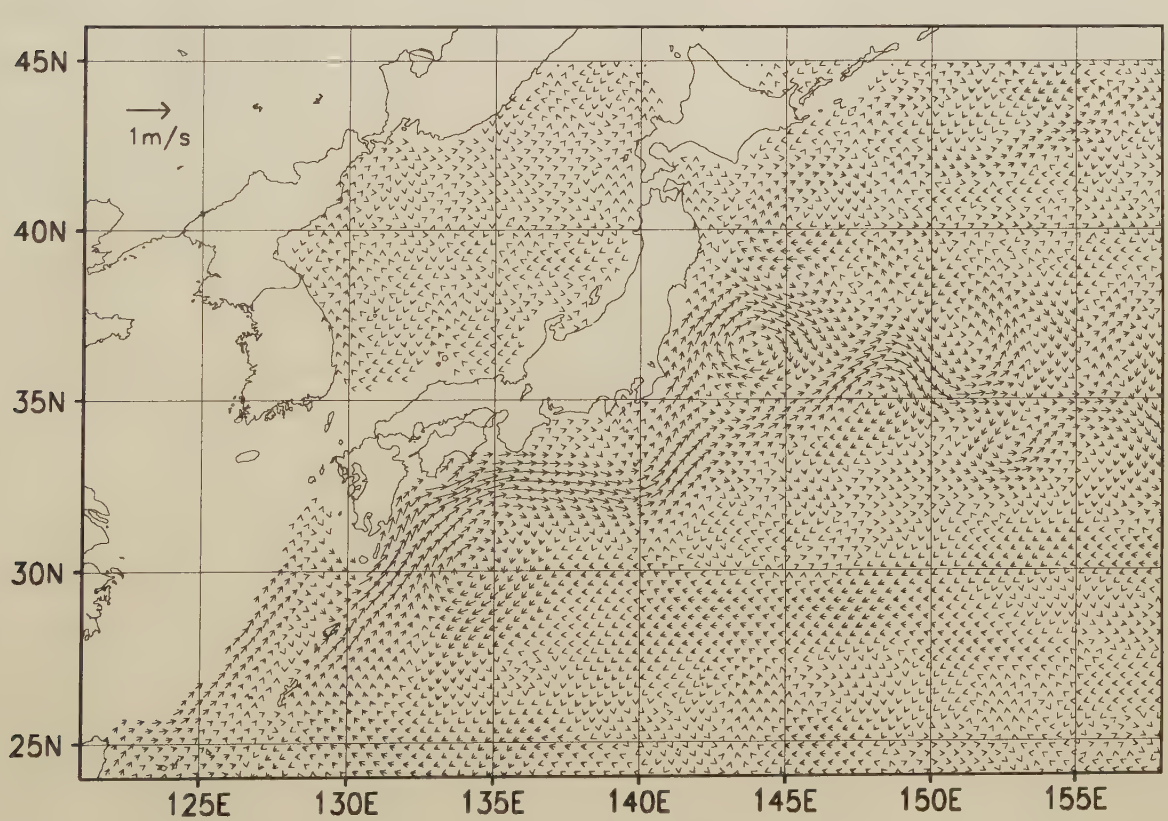


第７図　日本近海月平均表層水温図（上）と表層海流図（下）（深さ 200 m）（2001 年 11 月）
（海洋総合解析システムによる）

Fig. 7　Monthly mean subsurface (200 m) temperature (top) and current (bottom) in seas adjacent to Japan for November 2001. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)

400m Temperature / Current Adjacent to Japan

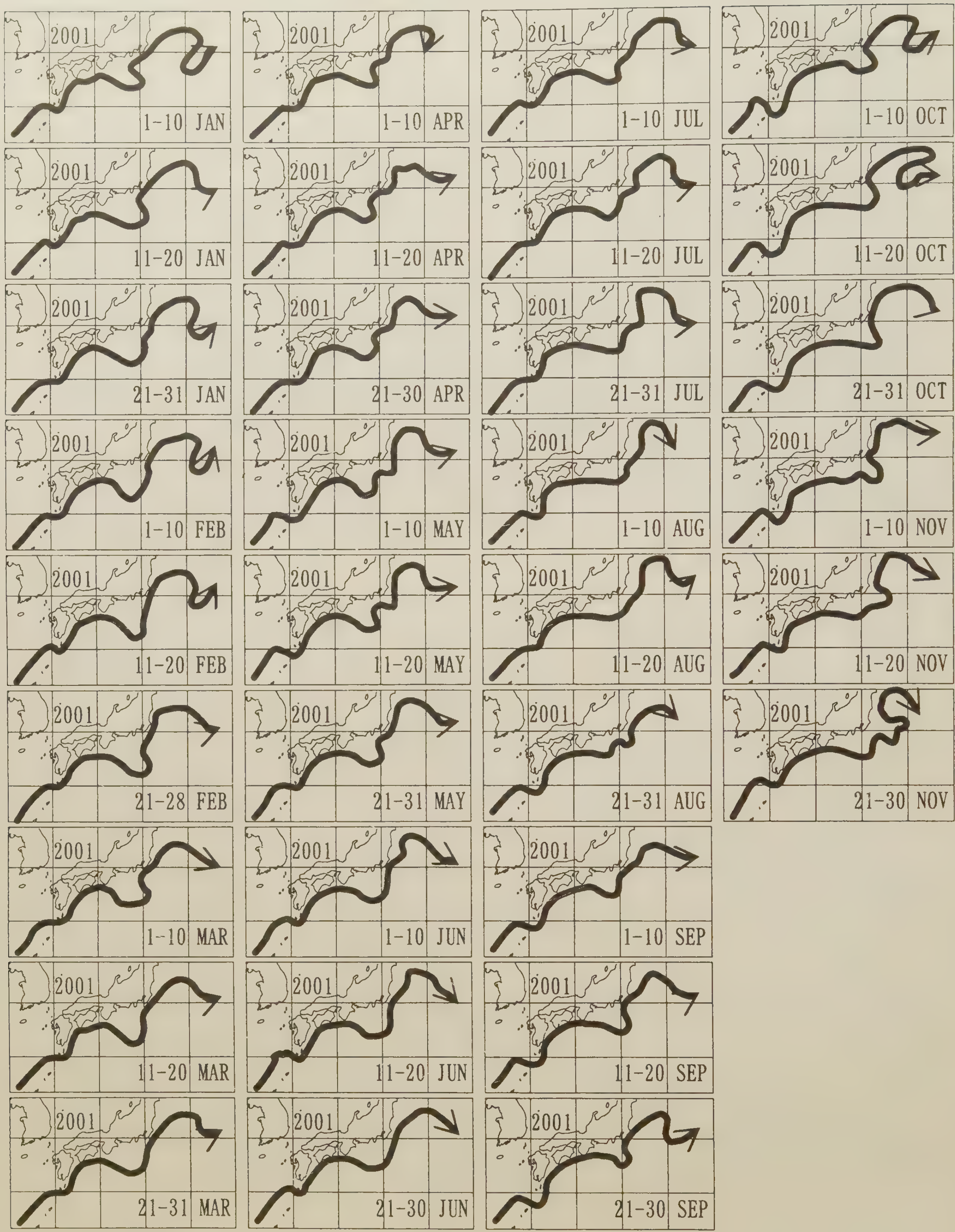




第 8 図　日本近海月平均表層水温図（上）と表層海流図（下）（深さ 400 m）（2001 年 11 月）
（海洋総合解析システムによる）

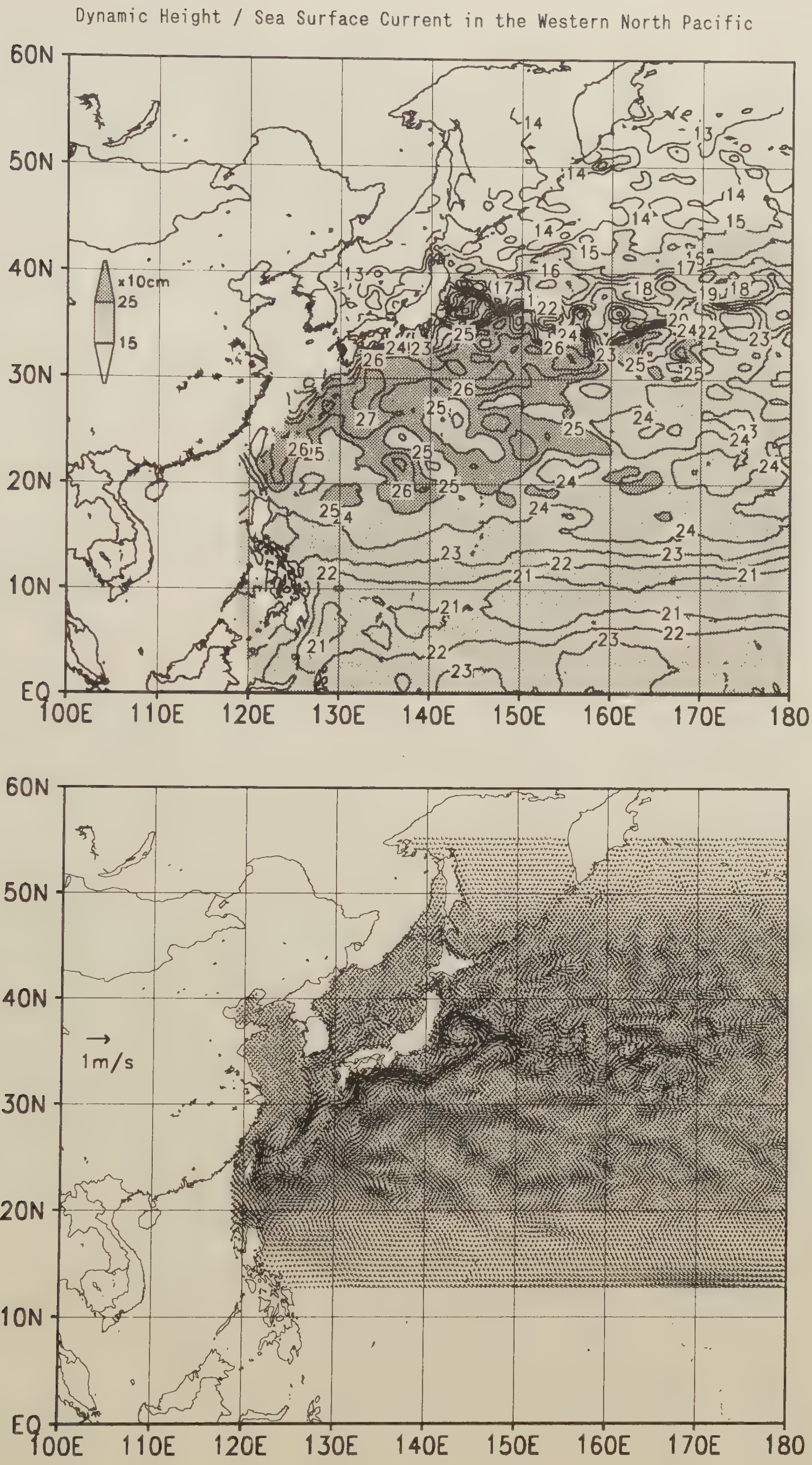
Fig. 8　Monthly mean subsurface (400 m) temperature (top) and current (bottom) in seas adjacent to Japan for November 2001. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)

Location of the Kuroshio axis



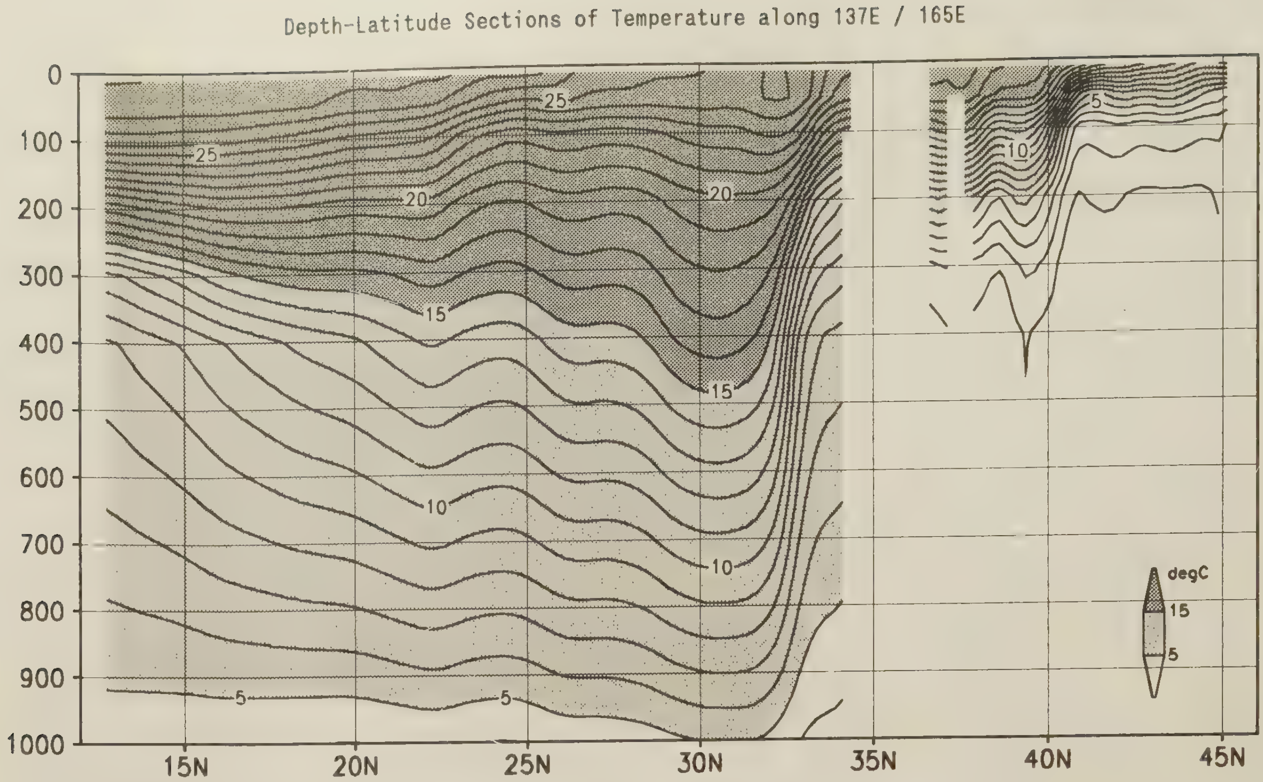
第9図　旬別黒潮流軸図

Fig. 9 Location of the Kuroshio axis



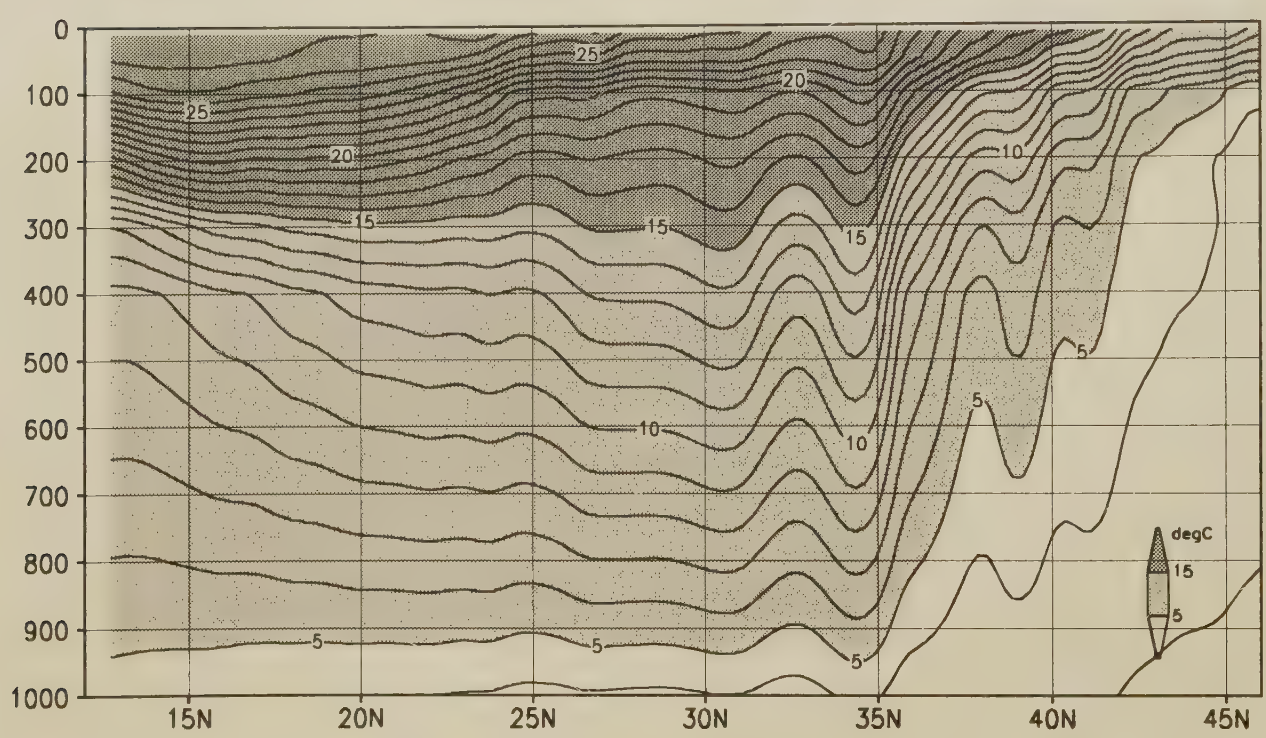
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（海洋総合解析システムによる）

Fig. 11　Vertical cross section of monthly mean temperature along 137 °E for November 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



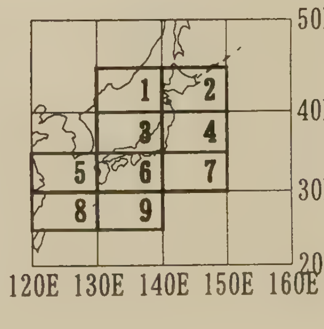
第 12 図　東経 165° 線に沿う月平均表層水温の鉛直断面図 （2001 年 11 月）
（海洋総合解析システムによる）

Fig. 12　Vertical cross section of monthly mean temperature along 165 °E for November 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)

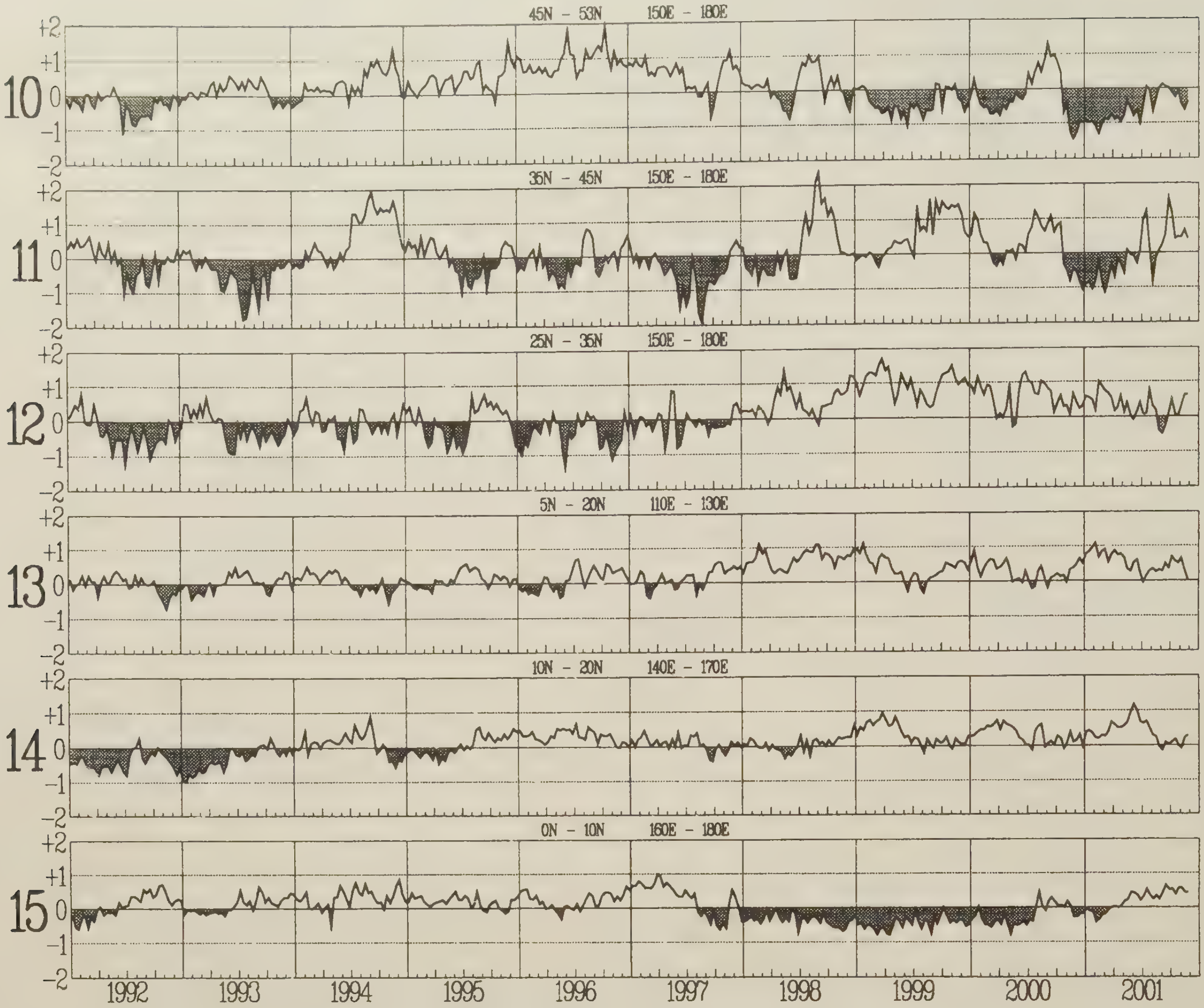


第13図　海域別旬平均海面水温平年偏差時系列図

Fig. 13 Time series of the ten-day mean SST anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).

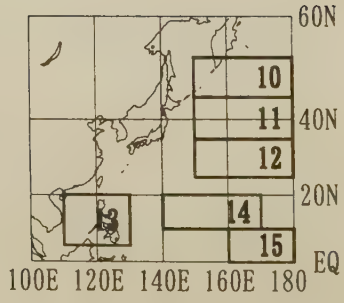


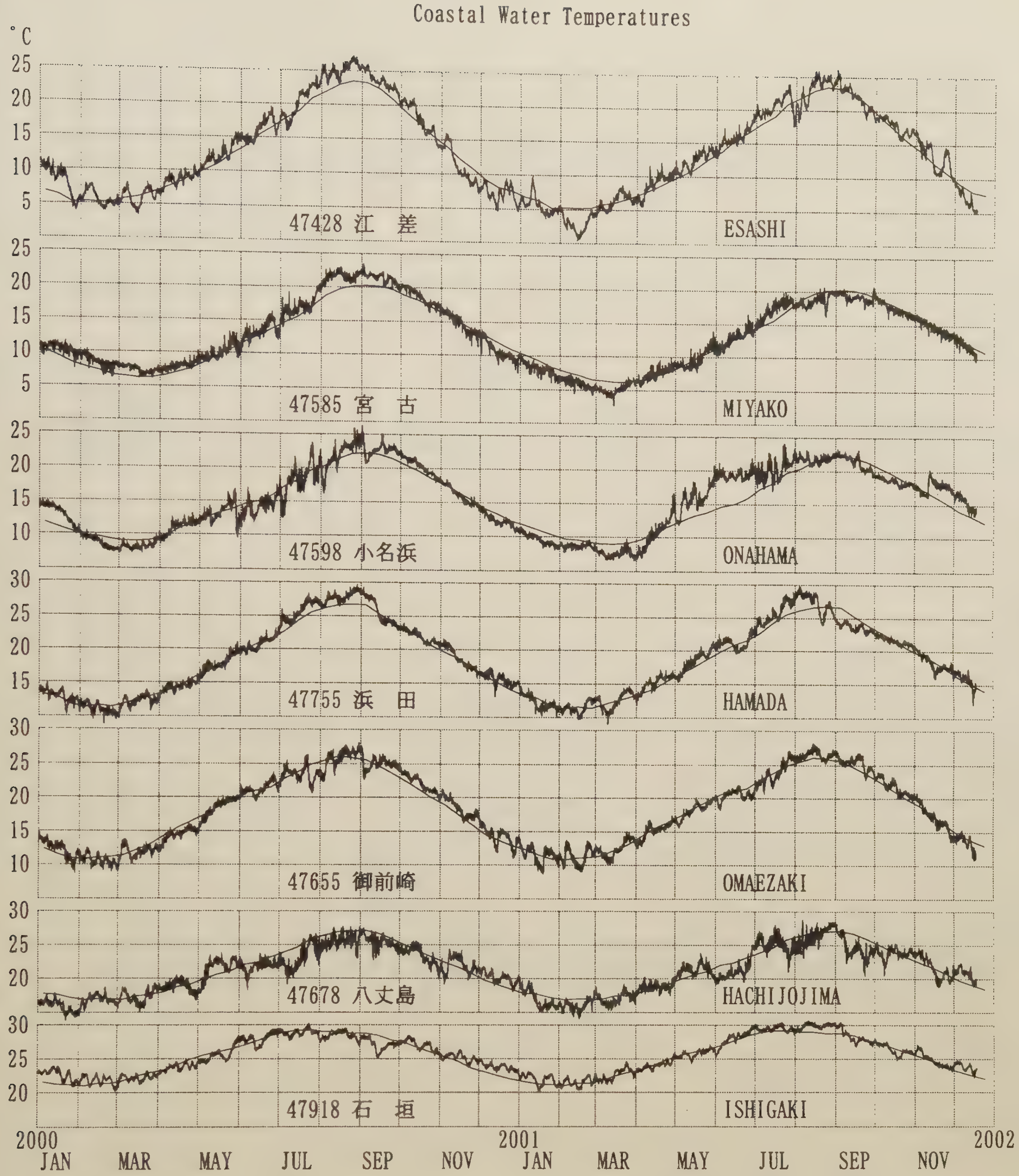
Time Series of Area Mean SST in the Western North Pacific

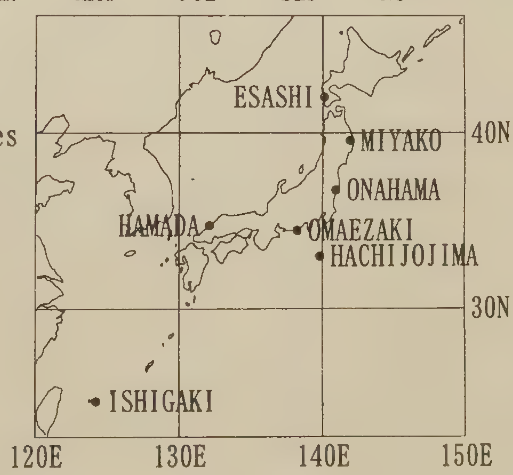


第13図　海域別旬平均海面水温平年偏差時系列図（つづき）

Fig. 13 (continue) Time series of the ten-day mean SST anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).

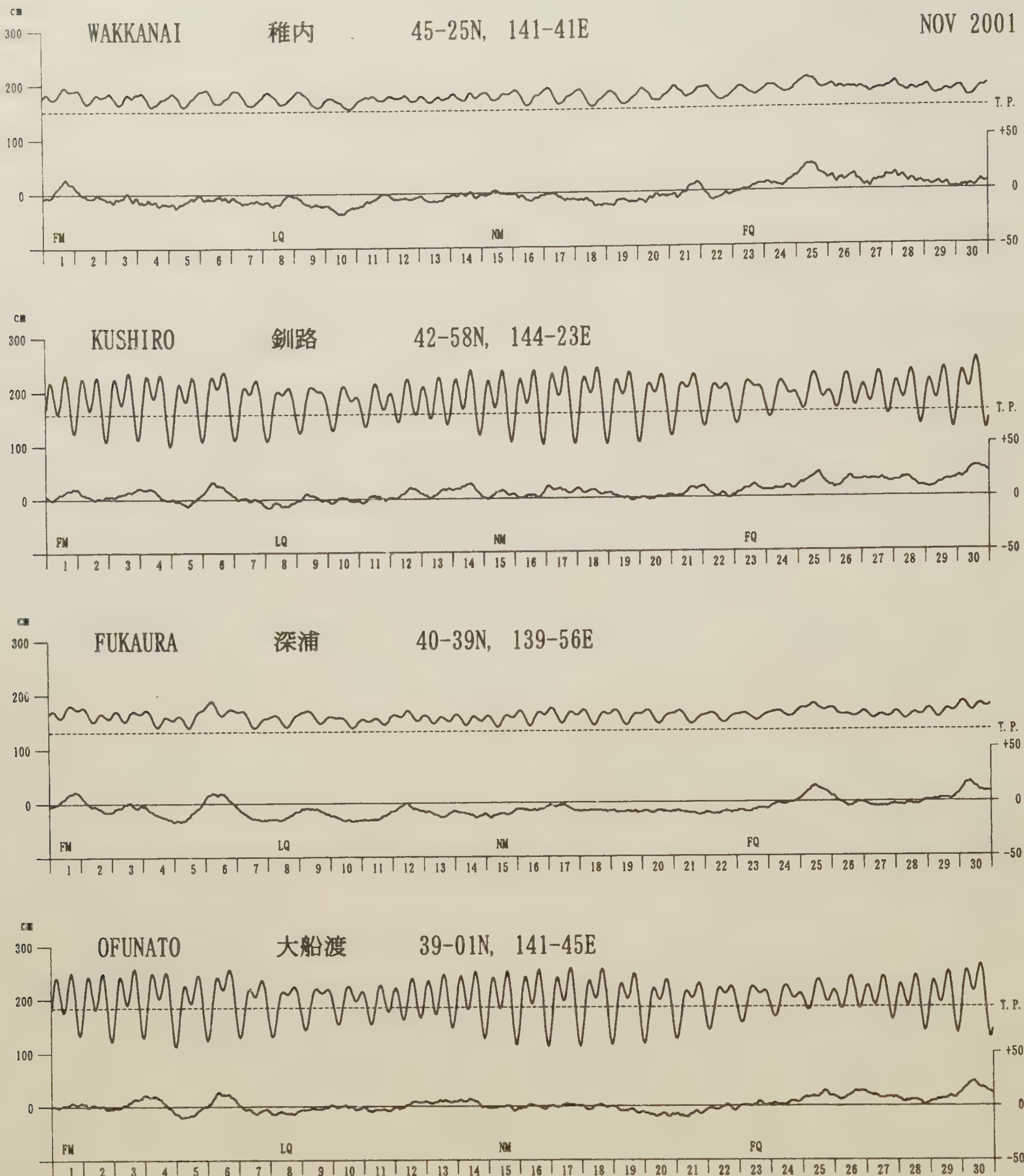






第14図 沿岸水温時系列図

Fig. 14 Time series of hourly coastal water temperatures (°C) measured at 7 coastal stations of the JMA shown in the right panel.
Thin lines show ten-day mean climatology.



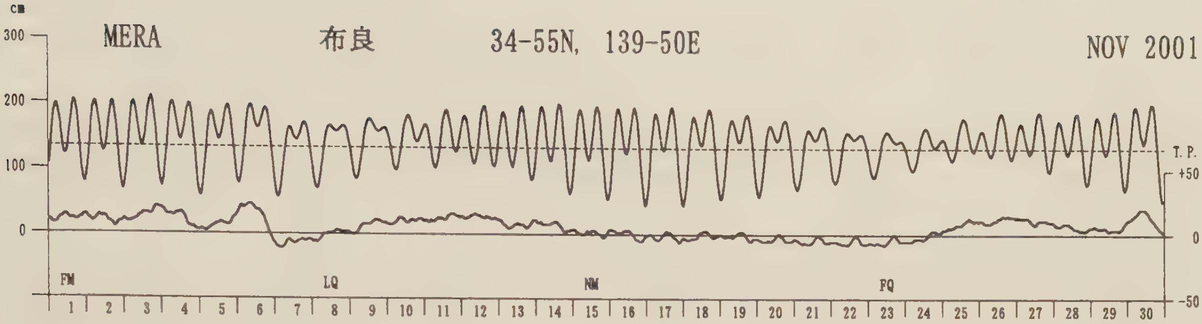


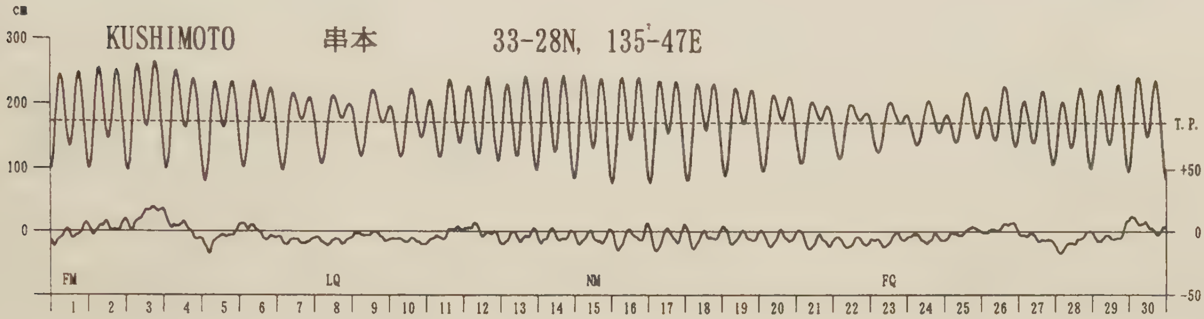
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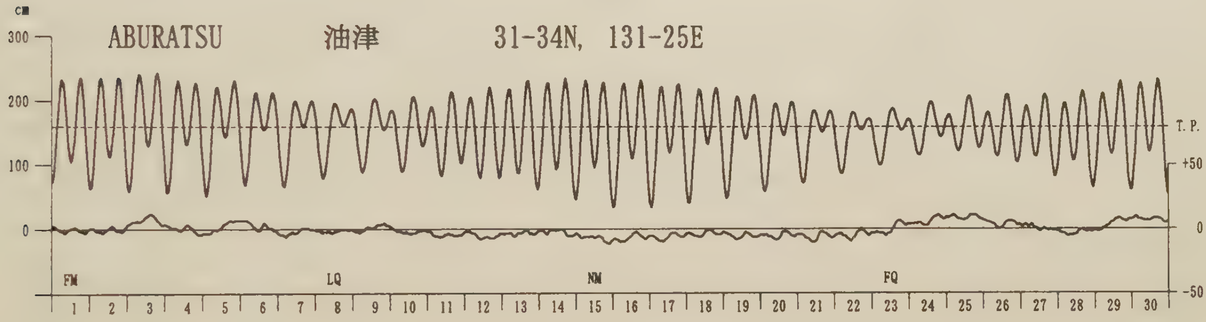
Fig. 15 Time series of hourly sea level observation (upper line) and its anomalies (lower line) at 9 stations of the JMA in the right panel.
Short term variations are removed from raw data.

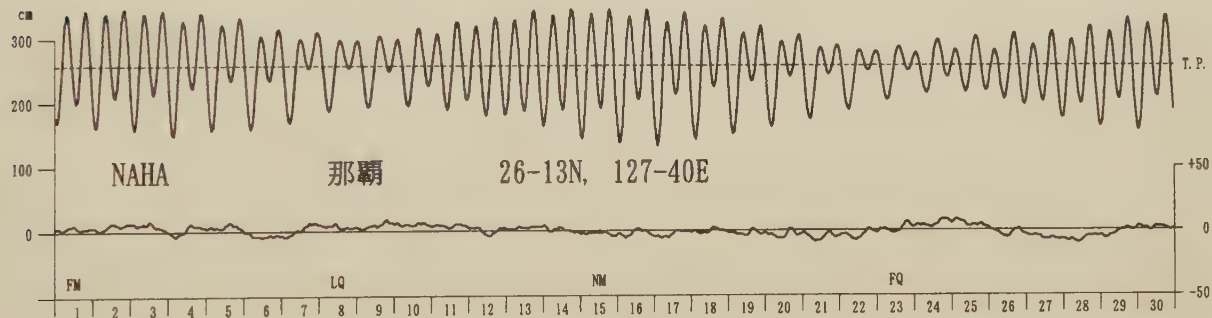
NM: new moon, FQ: first quarter
FM: full moon, LQ: last quarter
T. P. : Mean sea level of Tokyo Bay (Tokyo Peil)

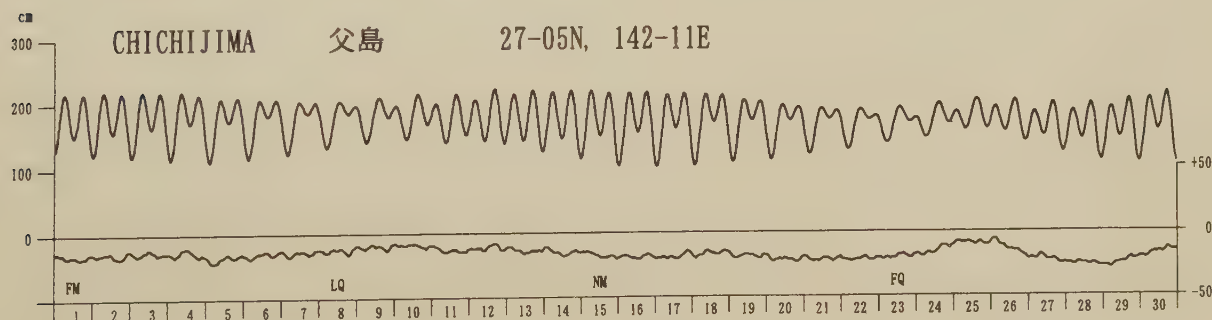
Time series of Sea Level





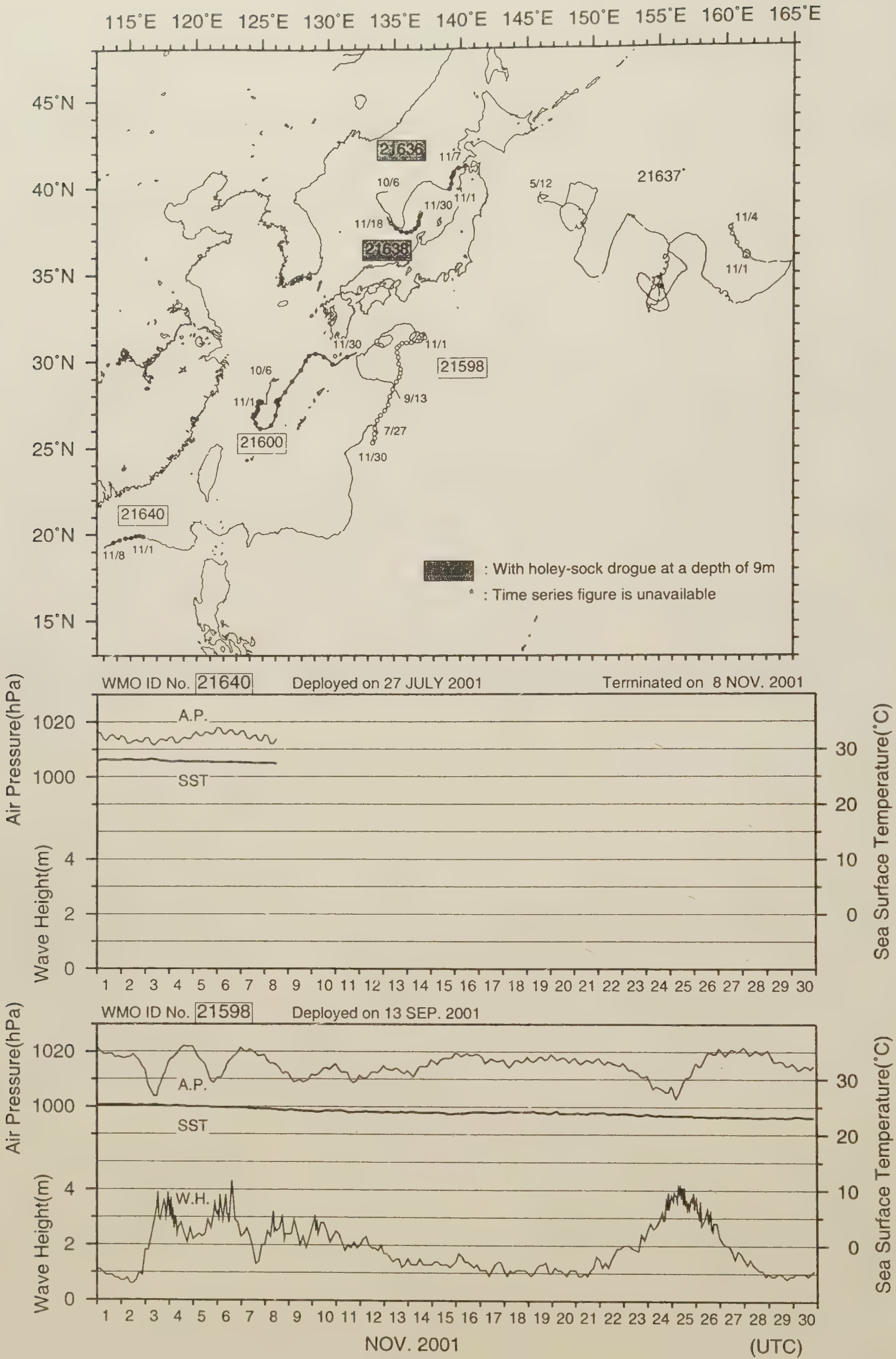






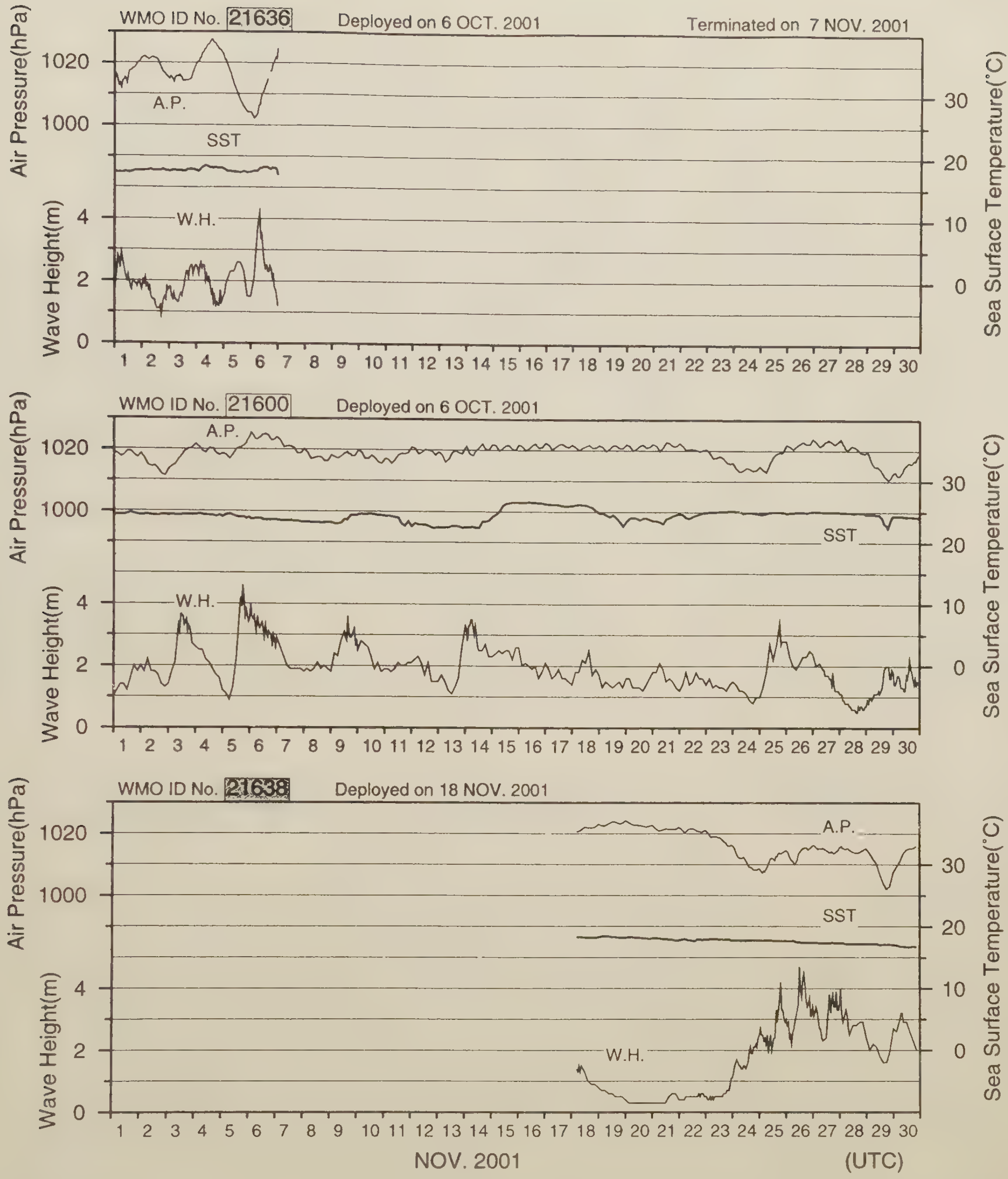
第15図 つづき

Fig. 15 continue

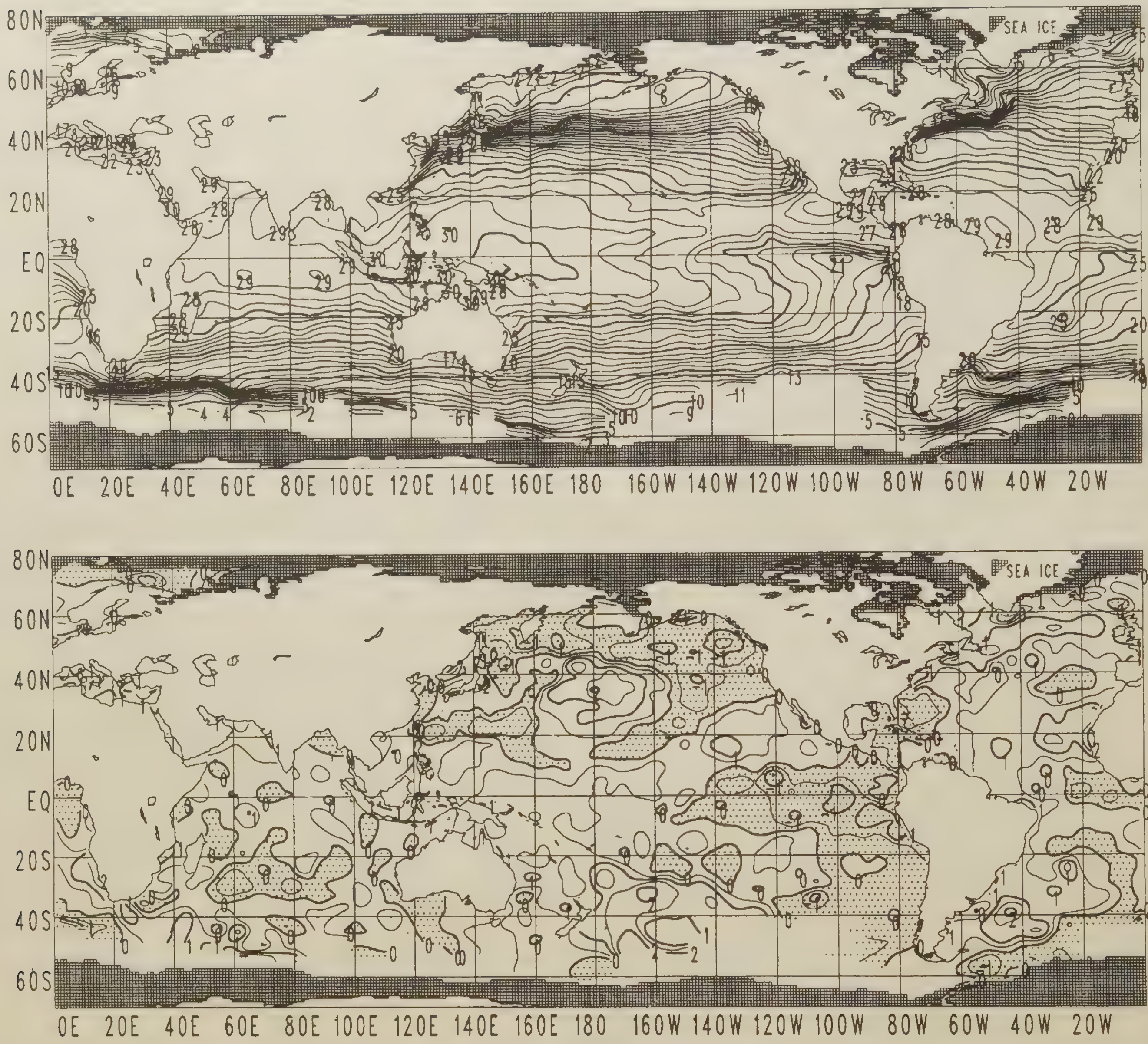


第16図　漂流型海洋気象ブイロボットの軌跡と観測要素の時系列図

Fig.16　Time series of JMA drifting buoy observation.
The upper panel shows paths of the buoys. Circles denote the position at 00h UTC everyday.
The lower panel shows time series of observation data.

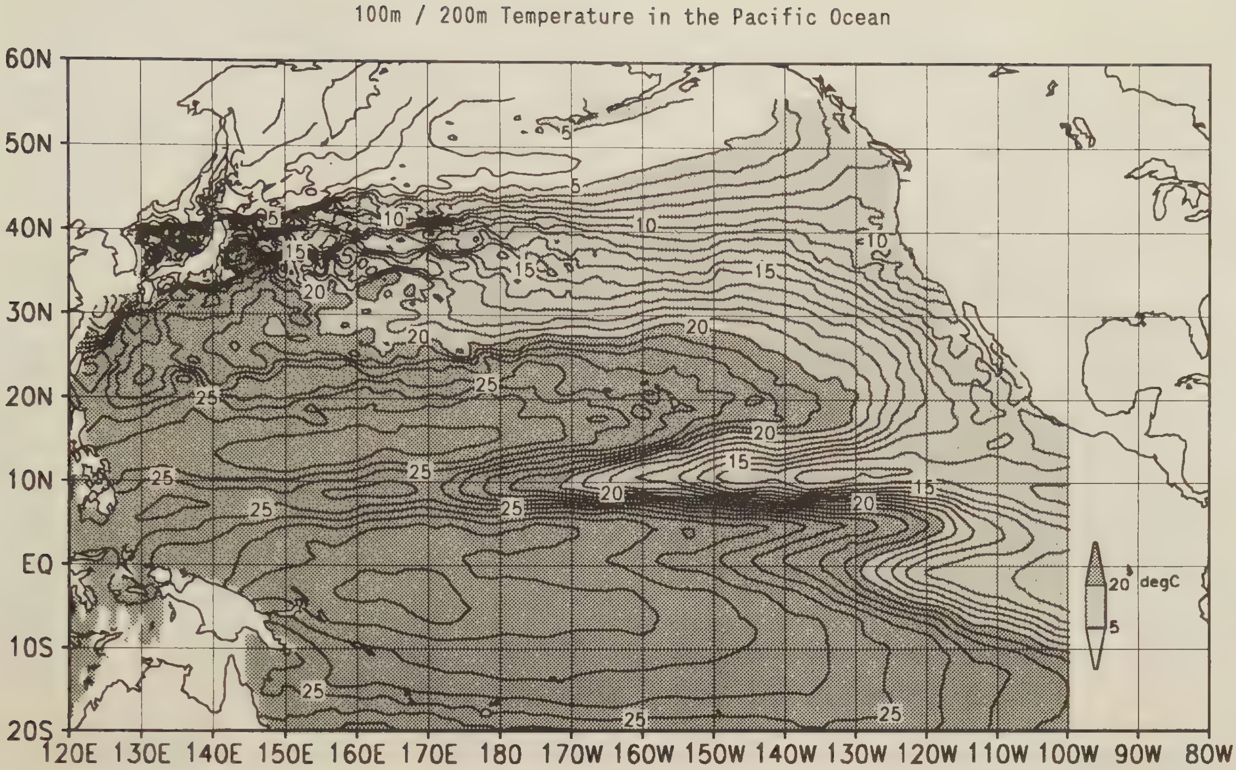


第16図 つづき
Fig.16 continue



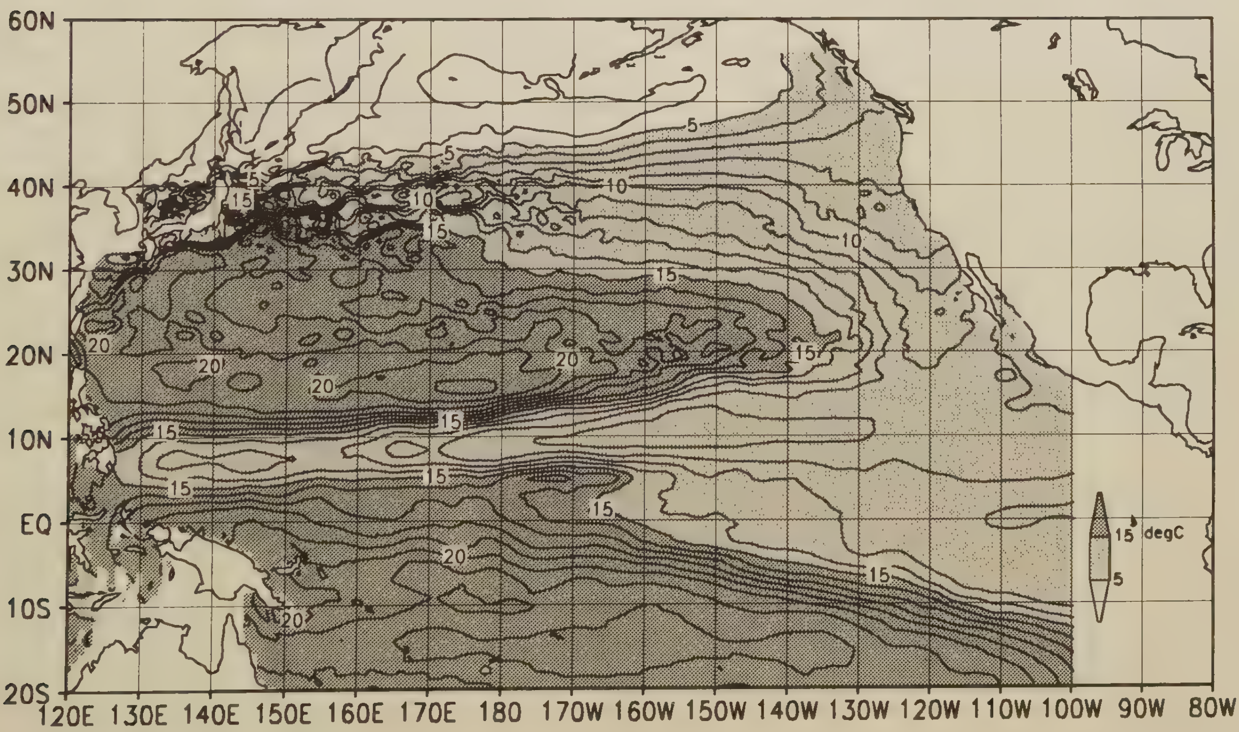
第17図　全球月平均海面水温図（上）及び偏差図（下）（2001年11月）

Fig. 17 Monthly mean SST over the global ocean (top) and anomalies (bottom) for NOV 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C (top) and additional anomaly contours of ±0.5°C are shown by thin lines. Negative anomalies are spotted. Maximum coverage of sea ice is shaded. Data sources for sea ice are U.S. National Ice Center (polar regions) and JMA (the Sea of Okhotsk).



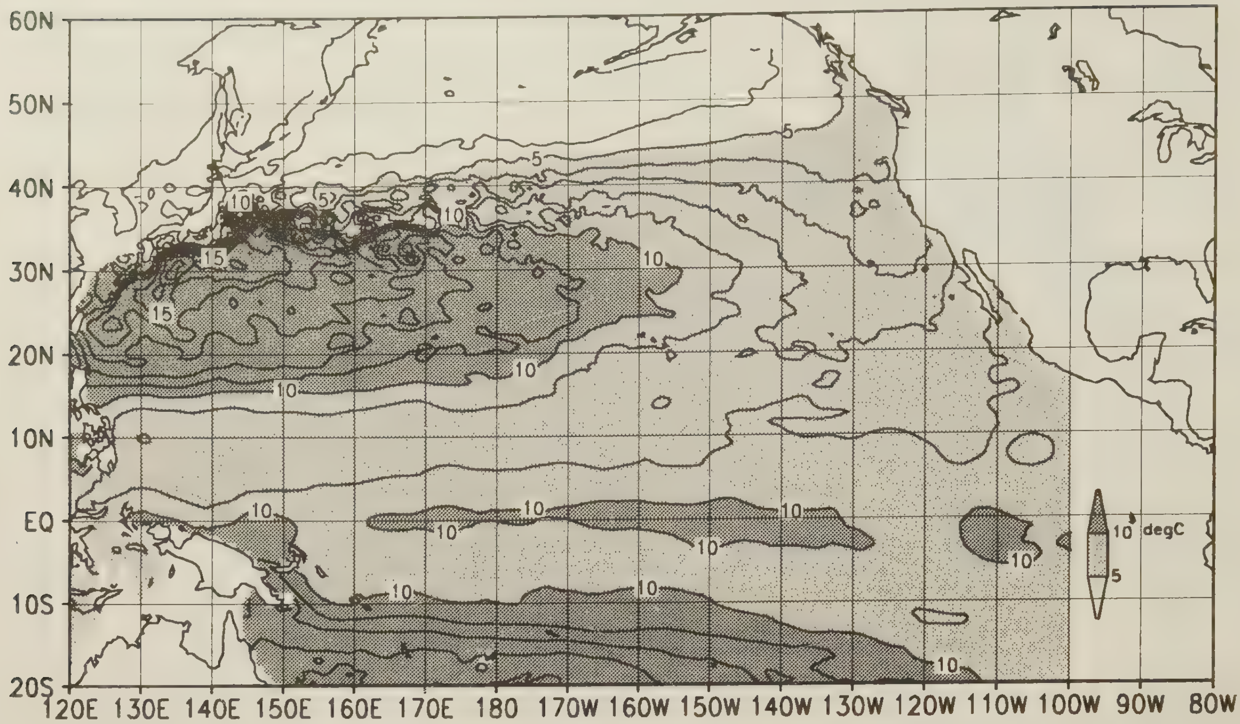
第 18 図　太平洋月平均表層水温図（深さ 100 m）　(2001 年 11 月)
（海洋総合解析システムによる）

Fig. 18　Monthly mean subsurface (100 m) temperature in the Pacific Ocean for November 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



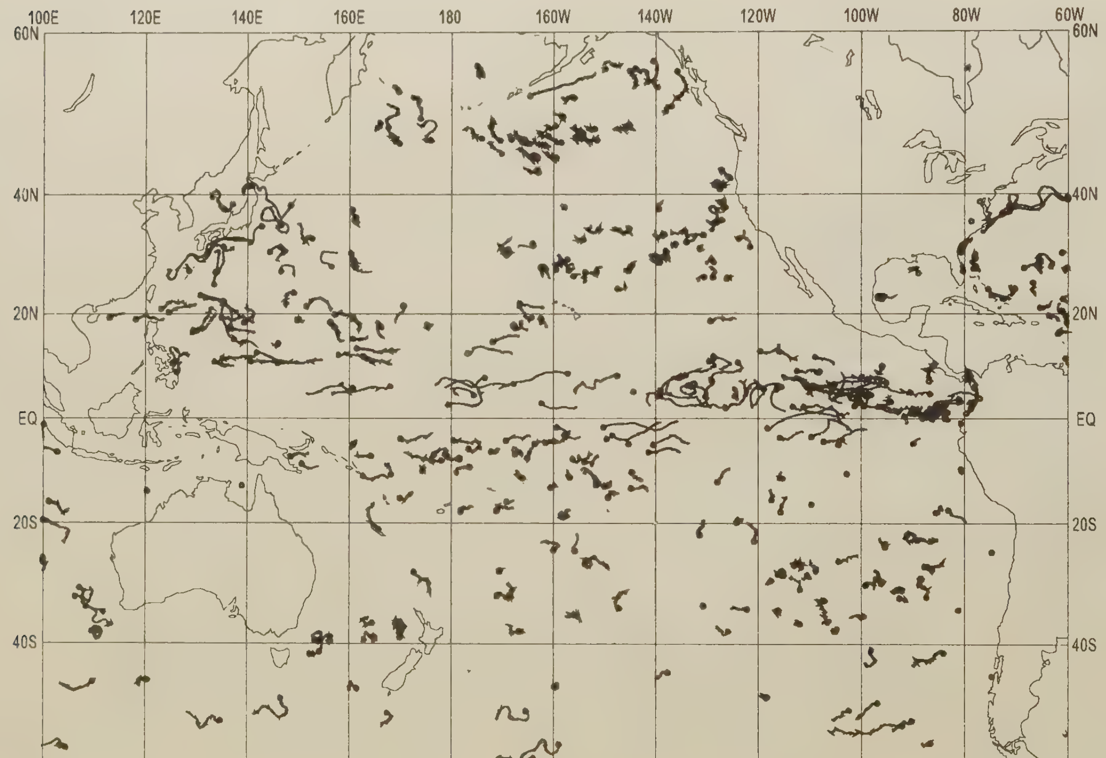
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（海洋総合解析システムによる）

Fig. 19　Monthly mean subsurface (200 m) temperature in the Pacific Ocean for November 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



第 20 図　太平洋月平均表層水温図（深さ 400 m）　(2001 年 11 月)
（海洋総合解析システムによる）

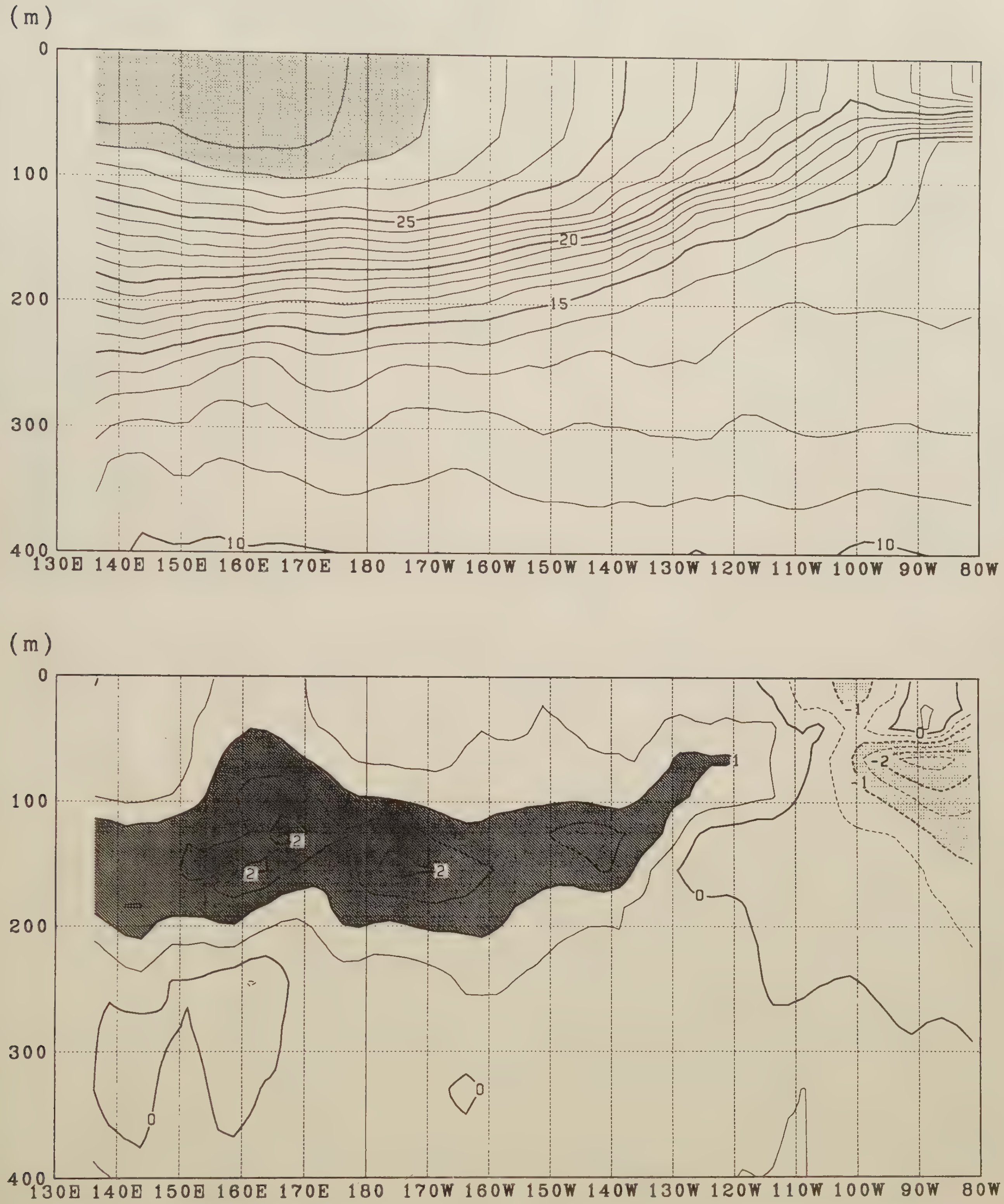
Fig. 20　Monthly mean subsurface (400 m) temperature in the Pacific Ocean for November 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



第 21 図　太平洋ブイ流跡図（2001 年 11 月）

Fig. 21　Trajectories of drifting buoys in the Pacific Ocean during November 2001. Each track is for one buoy. Small circles represent the last positions for the month.

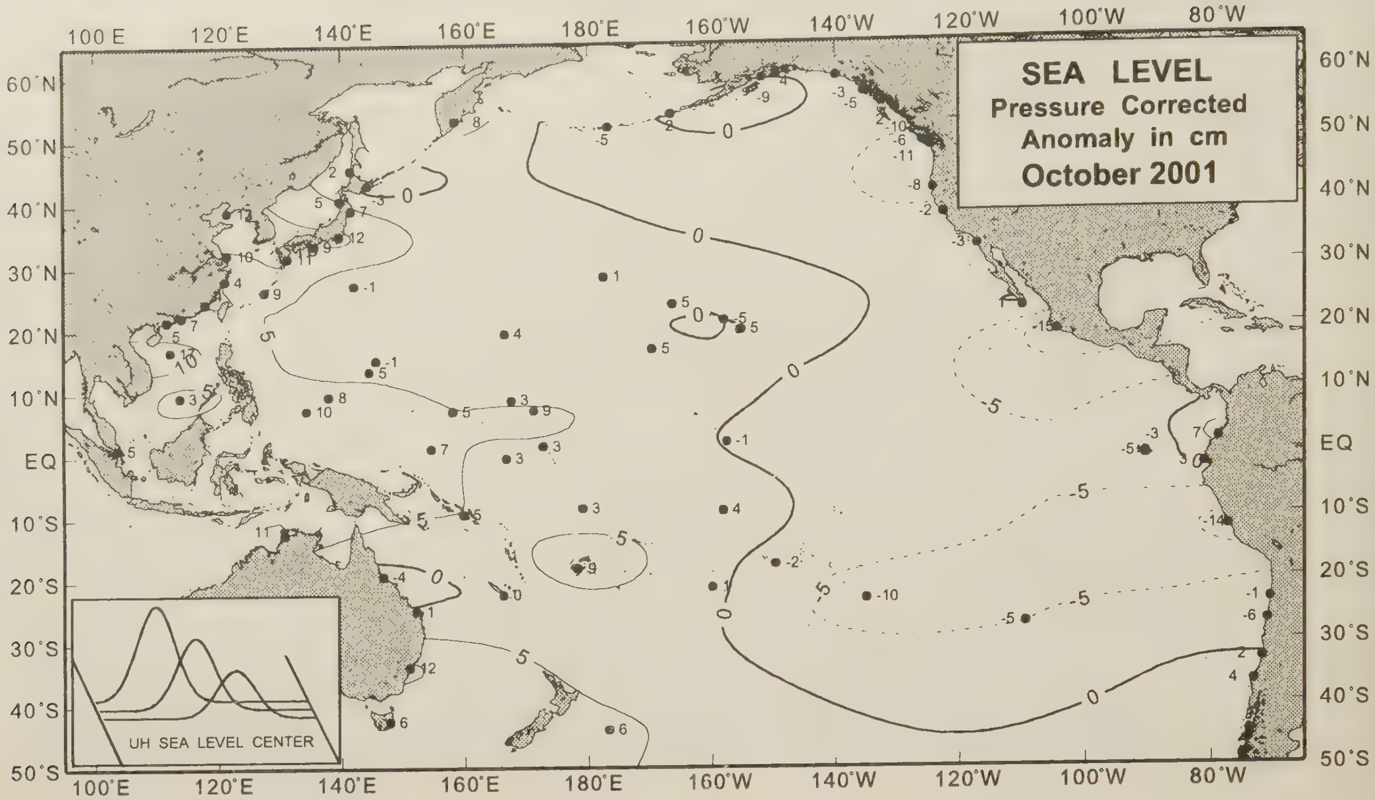
Depth-Longitude Sections of Equatorial Temperature & Anomalies



第22図　太平洋赤道に沿う表層水温（上）及び偏差（下）の深度－経度断面図（2001年11月）

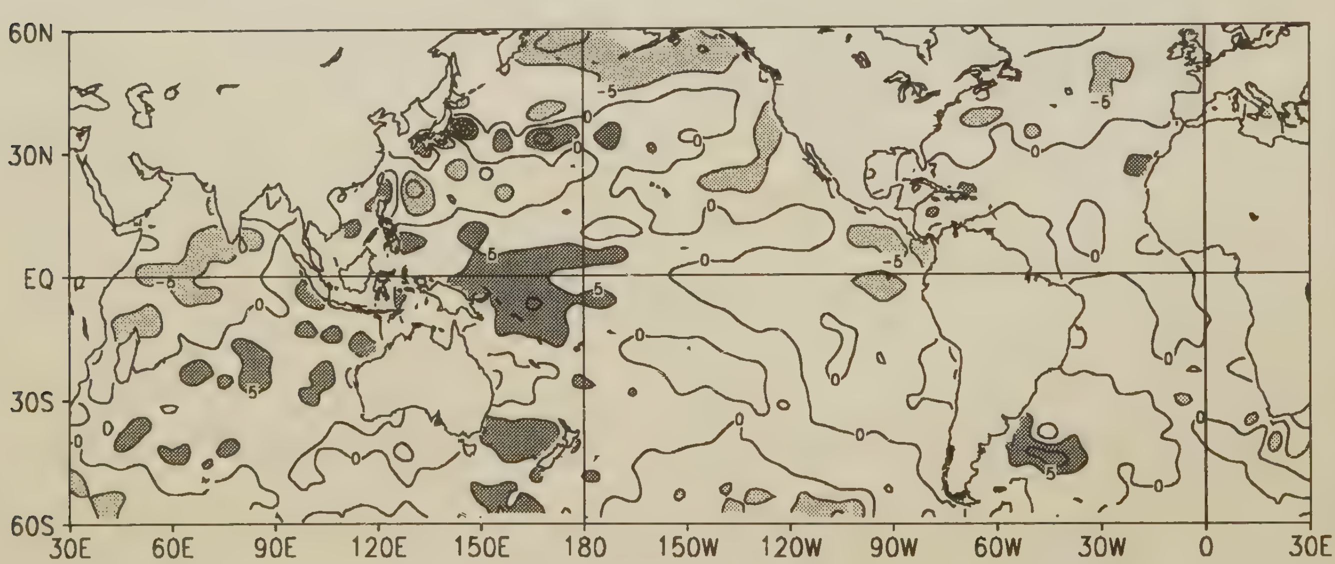
Fig. 22 Depth-longitude sections of temperature (top) and anomalies (bottom) along the equator in the Pacific Ocean for NOV 2001. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (top) and 0.5°C (bottom). Values greater than 28°C in the top panel are shaded. In the bottom panel, values greater than 1°C are shaded and values less than -1°C are spotted. Anomalies are computed from 1987-2000 base period means.

Sea Level Anomalies / Sea Surface Height Anomalies



第 23 図　太平洋月平均海面水位偏差図 (2001 年 10 月)

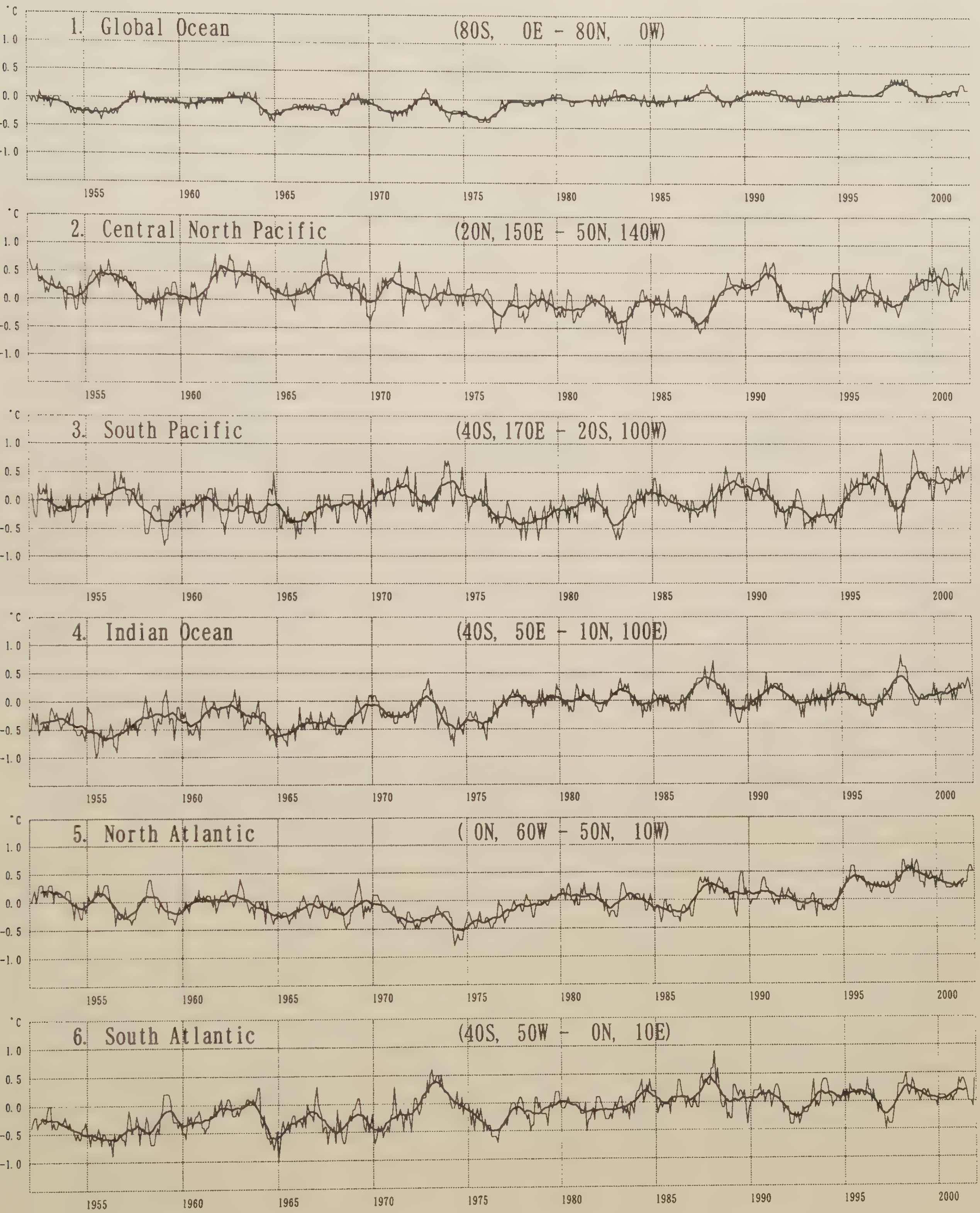
Fig. 23　Monthly sea level anomalies for October 2001 obtained from mean sea level (1975-1995) adjusted for atmospheric pressure. This figure is prepared by the SOC of ISLP-PAC, Department of Oceanography, University of Hawaii.



第 24 図　全球月平均海面高度偏差図 (2001 年 10 月)

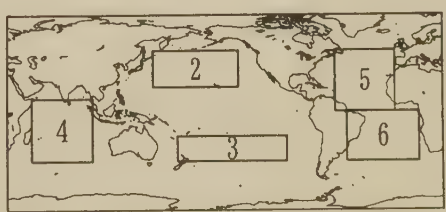
Fig. 24　Monthly sea surface height anomalies in the global ocean derived from the altimeter data of TOPEX/POSEIDON for October 2001. Contour interval is 5 cm. Positive anomalies exceeding +5 cm are shaded and negative anomalies exceeding -5 cm are spotted. Anomalies are computed from 1993-1998 base period means.

Long-term Variation of Monthly Mean SST Anomalies

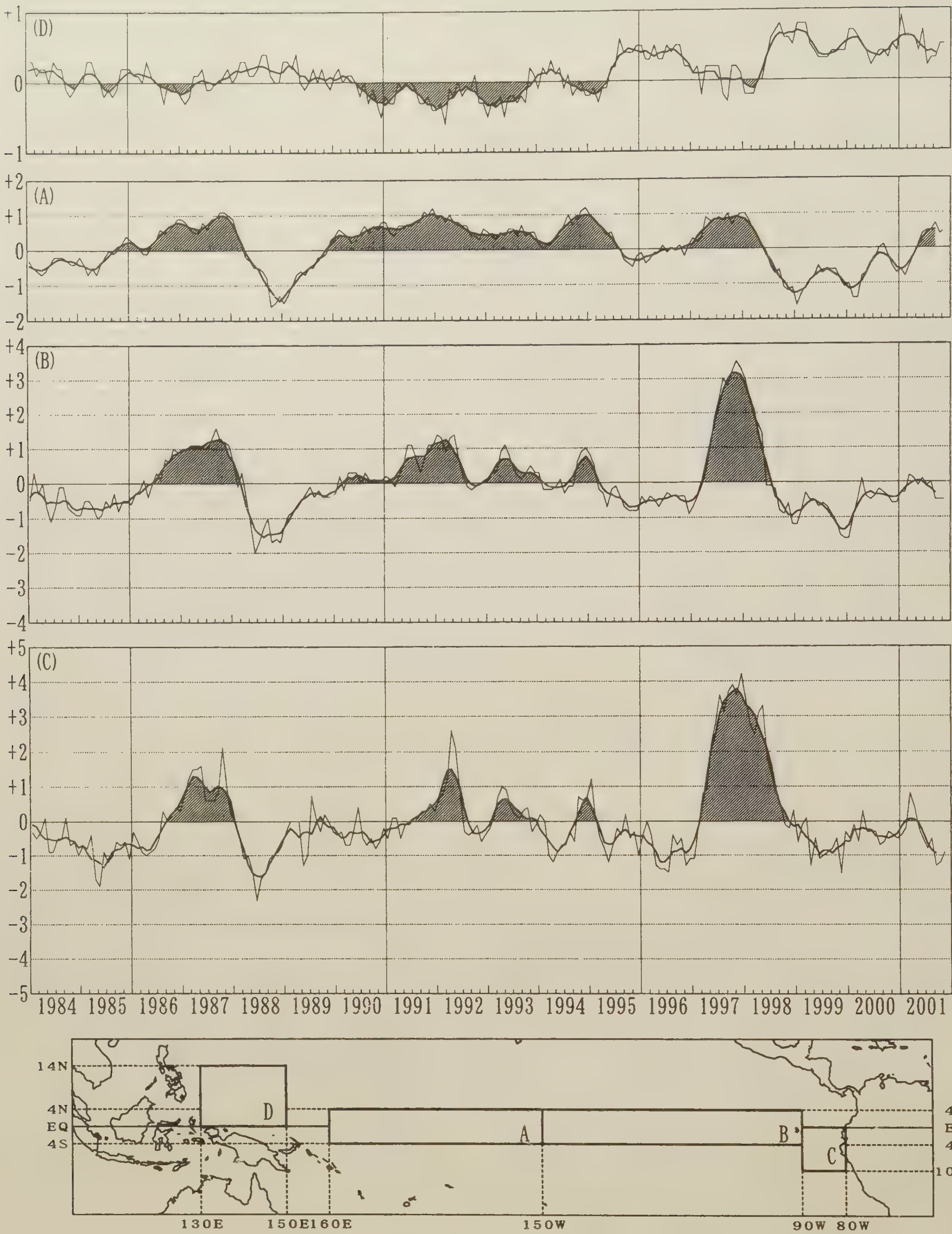


第25図 海域平均海面水温偏差の長期変動

Fig. 25 Long-term variations of monthly mean sea surface temperature anomalies (°C) for the areas shown in the right panel. Anomalies are computed from the JMA climatology (1971-2000). Thin lines show the monthly mean and thick lines their 13-month running means.



Time Series of Tropical Pacific SST Anomalies



第26図　太平洋熱帯域の海面水温偏差時系列図

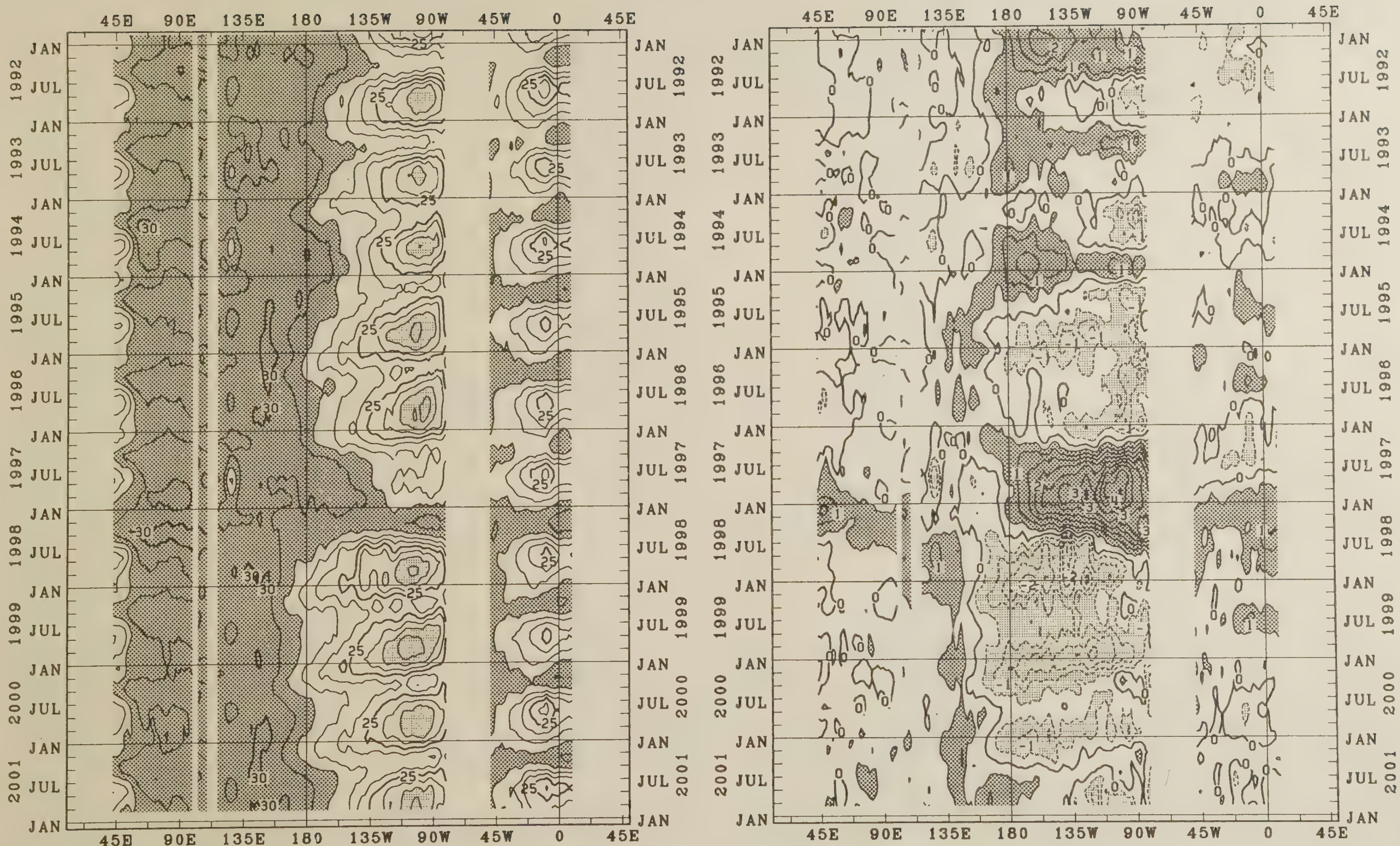
Fig. 26 Time series of monthly mean SST anomalies (°C) in the tropical Pacific Ocean for the areas indicated at the bottom panel. Thin lines show the monthly means and thick lines their 5-month running means. Positive anomalies (A, B, C) and negative anomalies (D) are shaded. Anomalies are computed from the JMA climatology (1971-2000).

Monitoring Indices in the Tropical Pacific

MONTH YEAR	SEA SURFACE TEMPERATURE AND ANOMALY (°C) REGION D 14N-EQ 130E-150E		REGION A 4N-4S 160E-150W		REGION B 4N-4S 150W-90W		REGION C EQ-10S 90W-80W		SOI	SEA LEVEL PRESSURE ANOMALY (hPa) TAHITI 17-33S 149-37W	DARWIN 12-24S 130-52E
JAN 99	29.3	0.8	26.4	-1.6	24.2	-1.2	23.9	-0.6	1.5	2.2	-1.2
FEB 99	29.1	0.8	26.7	-1.3	25.5	-0.8	25.9	-0.1	0.8	1.8	-0.2
MAR 99	29.3	0.8	27.0	-1.1	26.8	-0.3	26.4	0.1	0.9	0.9	-1.2
APR 99	29.3	0.5	27.3	-0.9	26.7	-0.5	24.1	-1.3	1.6	2.0	-0.5
MAY 99	29.7	0.4	27.8	-0.8	26.4	-0.5	23.8	-0.5	0.2	1.5	1.2
JUN 99	29.7	0.3	28.0	-0.5	25.5	-0.7	21.8	-1.1	0.3	1.2	0.7
JUL 99	29.6	0.3	27.8	-0.7	24.8	-0.6	20.9	-1.0	0.4	1.3	0.6
AUG 99	29.5	0.3	27.8	-0.6	24.0	-0.7	20.0	-0.9	0.4	1.8	1.2
SEP 99	29.7	0.4	27.8	-0.6	23.8	-0.9	19.7	-0.8	0.0	0.6	0.6
OCT 99	29.8	0.4	27.8	-0.6	23.6	-1.1	20.4	-0.5	1.1	1.7	-0.0
NOV 99	29.7	0.4	27.5	-0.9	23.2	-1.5	20.3	-1.5	1.2	1.6	-0.4
DEC 99	29.4	0.4	27.1	-1.1	23.4	-1.6	22.6	-0.3	1.6	2.6	-0.3
JAN 00	29.2	0.7	27.0	-1.0	23.8	-1.6	24.0	-0.5	0.5	1.7	0.6
FEB 00	29.0	0.7	26.6	-1.4	25.3	-1.0	25.9	-0.1	1.2	3.1	0.2
MAR 00	29.1	0.6	26.7	-1.4	26.6	-0.5	25.7	-0.6	1.1	2.1	-0.2
APR 00	29.3	0.5	27.4	-0.8	27.3	0.1	25.7	0.3	1.4	1.5	-0.6
MAY 00	29.7	0.4	27.9	-0.7	26.5	-0.4	24.0	-0.3	0.3	1.2	0.8
JUN 00	29.6	0.2	28.1	-0.4	25.7	-0.5	22.6	-0.3	-0.4	0.8	1.2
JUL 00	29.6	0.3	28.2	-0.3	25.0	-0.4	21.6	-0.3	-0.3	-0.1	0.5
AUG 00	29.6	0.4	28.4	0.0	24.5	-0.2	20.2	-0.7	0.7	0.7	-0.5
SEP 00	29.7	0.4	28.5	0.1	24.4	-0.3	19.9	-0.6	1.0	2.0	0.2
OCT 00	29.7	0.3	28.2	-0.2	24.3	-0.4	20.6	-0.3	1.0	0.7	-1.0
NOV 00	29.8	0.5	27.9	-0.5	24.1	-0.6	21.4	-0.4	1.9	1.6	-1.9
DEC 00	29.4	0.4	27.5	-0.7	24.4	-0.6	22.4	-0.5	0.9	-0.3	-2.1
JAN 01	29.4	0.9	27.4	-0.6	25.1	-0.3	24.1	-0.4	0.8	3.0	1.1
FEB 01	28.9	0.6	27.2	-0.8	26.0	-0.3	25.8	-0.2	1.0	-0.0	-2.7
MAR 01	29.1	0.6	27.6	-0.5	27.3	0.2	27.1	0.8	0.8	1.8	0.2
APR 01	29.4	0.6	28.0	-0.2	27.3	0.1	25.8	0.4	0.2	0.4	0.2
MAY 01	29.7	0.4	28.7	0.1	26.8	-0.1	24.1	-0.2	-0.8	0.2	1.3
JUN 01	30.1	0.7	28.9	0.4	26.3	0.1	22.4	-0.5	0.3	0.3	-0.1
JUL 01	29.5	0.2	29.0	0.5	25.3	-0.1	21.1	-0.8	-0.3	0.3	0.8
AUG 01	29.5	0.3	28.9	0.5	24.7	0.0	20.4	-0.5	-0.6	-0.4	0.5
SEP 01	29.6	0.3	29.1	0.7	24.2	-0.5	19.2	-1.3	0.2	0.3	0.0
OCT 01	29.9	0.5	28.8	0.4	24.2	-0.5	19.7	-1.2	-0.1	-0.5	-0.4
NOV 01	29.8	0.5	28.9	0.5	24.2	-0.5	20.9	-0.9	0.7	1.1	0.0

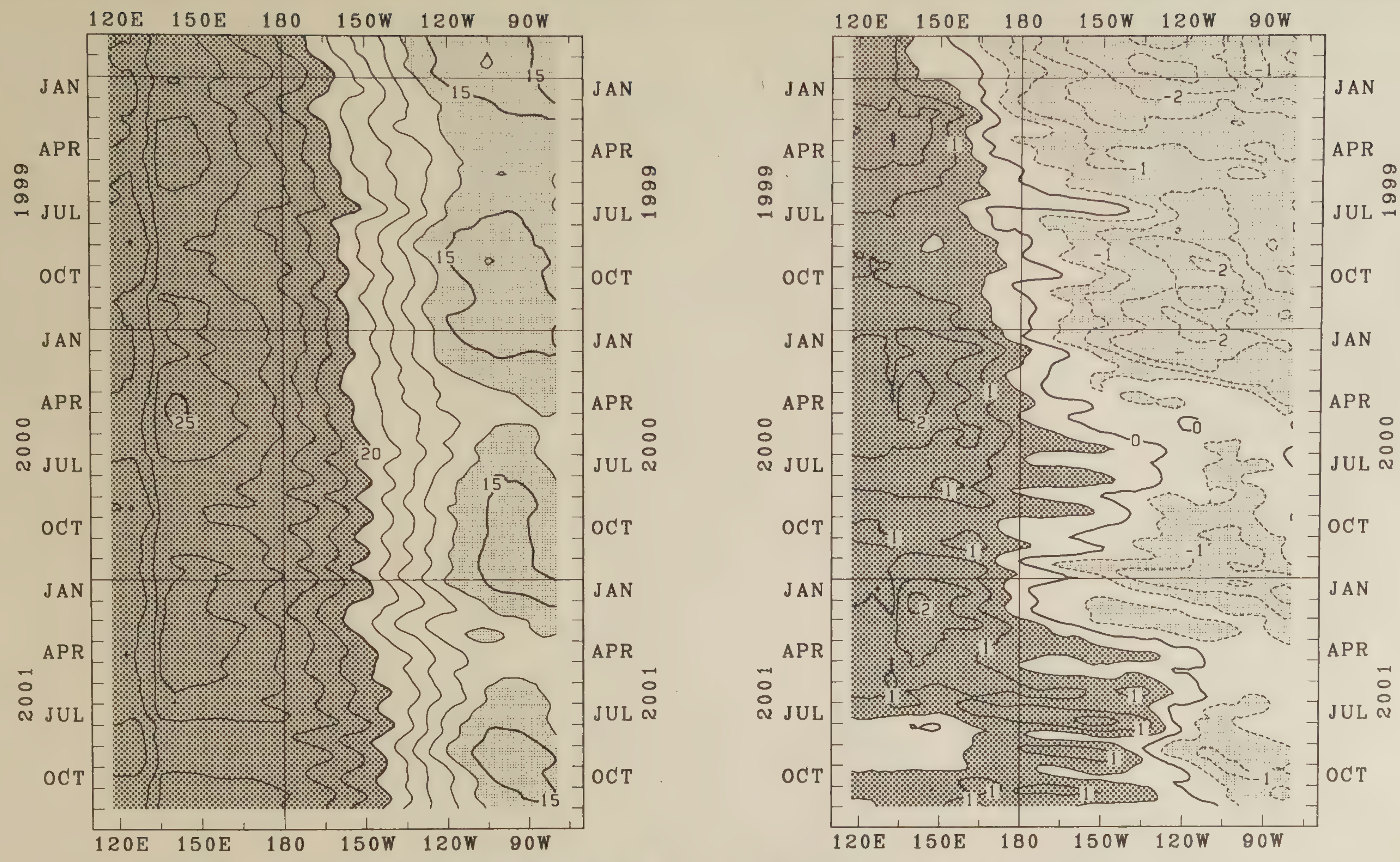
第1表　太平洋熱帯域の大気及び海洋の監視指数

Table 1 Atmospheric and oceanic monitoring indices in the tropical Pacific Ocean



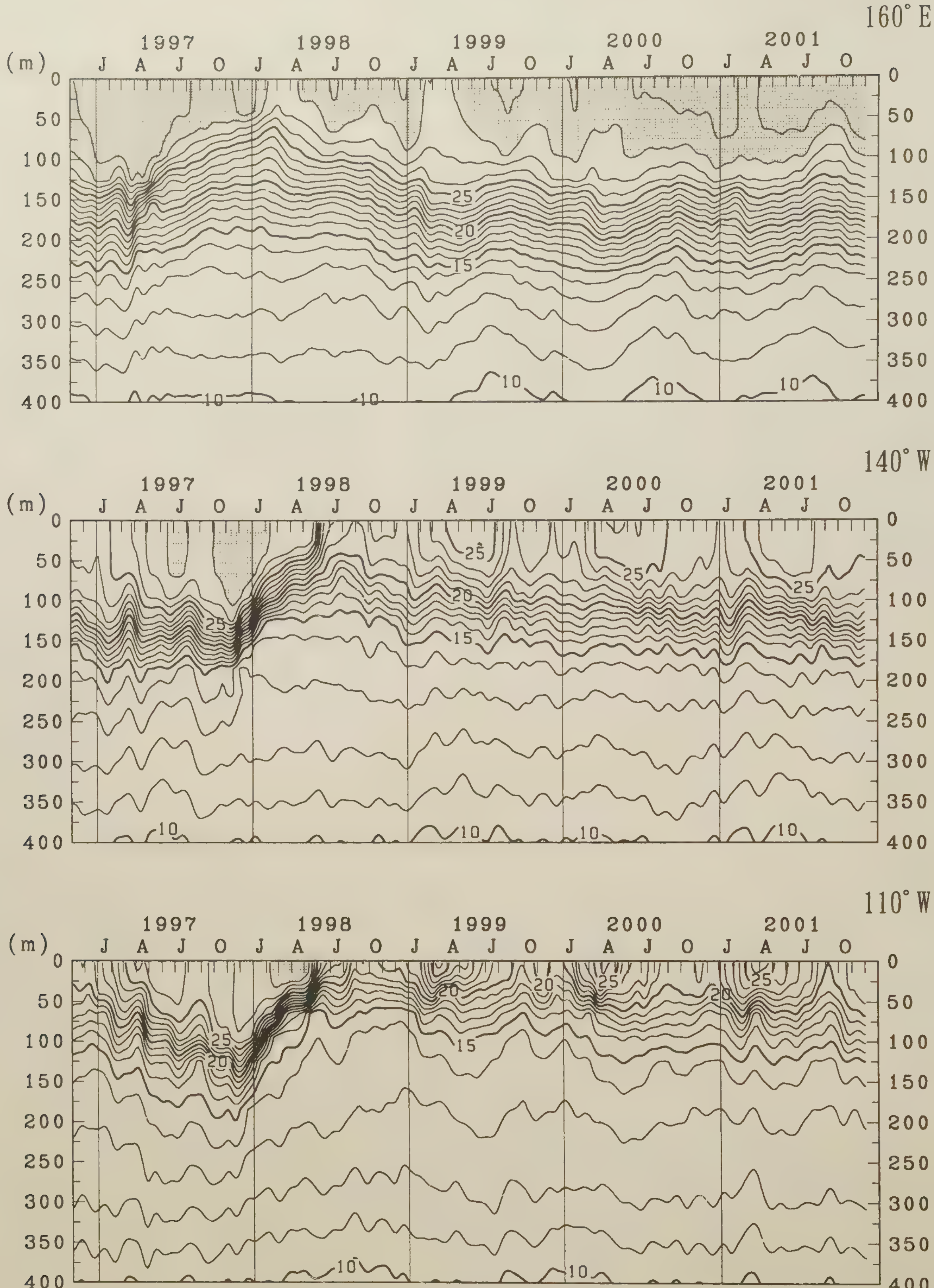
第 27 図　赤道に沿った海面水温（左）および偏差（右）の時間-経度断面図

Fig. 27　Time-longitude sections of SSTs (left) and anomalies (right) along the equator (2 °N-2 °S) in the global ocean. Contour interval is 1 °C (left) and 0.5 °C (right). Values greater than 28 °C are shaded and values less than 23 °C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1971-2000 base period means.



第28図　太平洋の赤道に沿う海洋表層の貯熱量（左）及び偏差（右）の時間－経度断面図

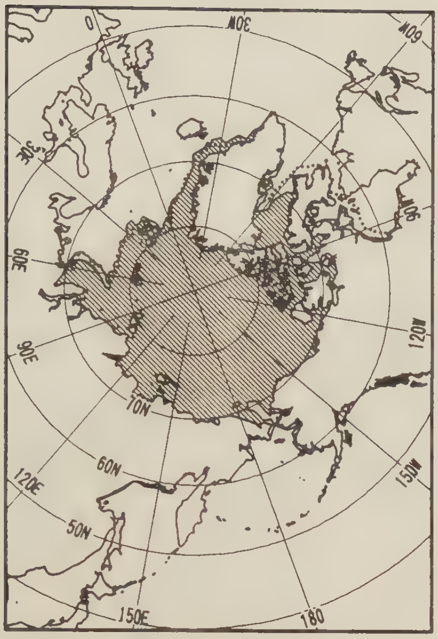
Fig. 28 Time-longitude sections of ocean heat content in the upper 260 m along the equator (left) and anomalies (right) in the Pacific Ocean. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (left) and 0.5°C (right). Values greater than 20°C are shaded and values less than 16°C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1987-2000 base period means.



第29図　太平洋赤道域の表層水温の時間－深度断面図

（上：西部、中：中部、下：東部）

Fig. 29 Time-depth sections of equatorial subsurface temperature for the western Pacific (top, 160°E), the central Pacific (middle, 140°W) and the eastern Pacific (bottom, 110°W). Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C. Values greater than 28°C are shaded.

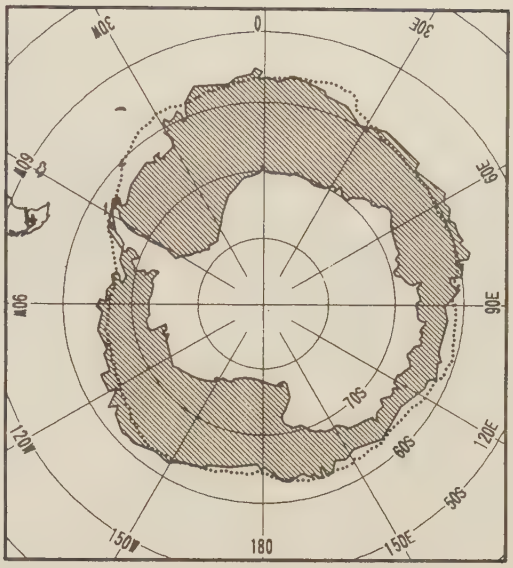


第30-1図　北極域の海氷図（2001年11月15日）

Fig.30-1 Sea ice chart in the Arctic on 15 Nov. 2001.

The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1972 through 1990.

The data source is the National Ice Center (USA).

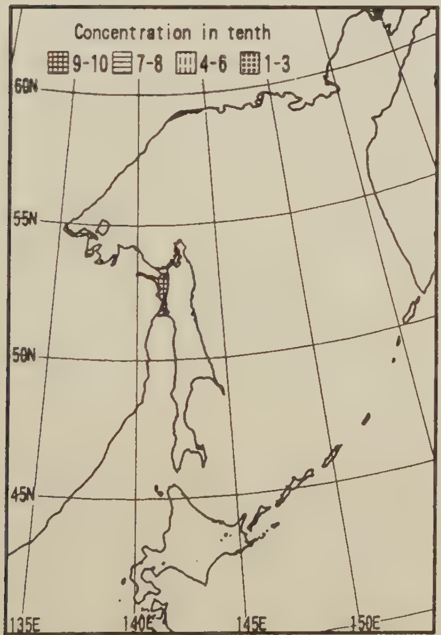


第30-2図　南極域の海氷図（2001年11月14日）

Fig.30-2 Sea ice chart in the Antarctic on 14 Nov. 2001.

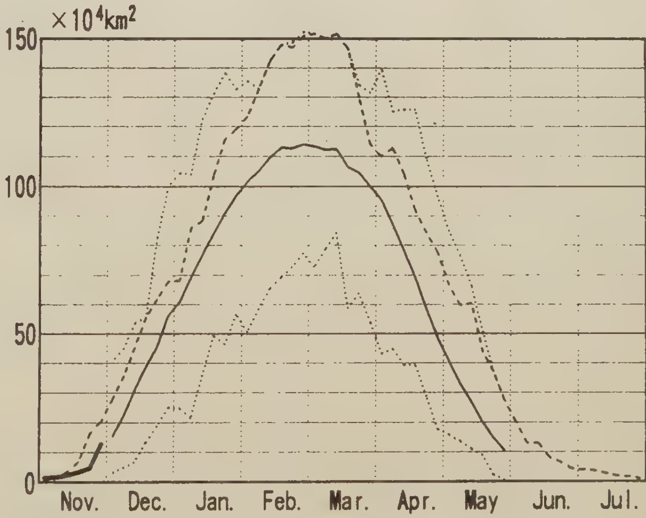
The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1973 through 1990.

The data source is the National Ice Center (USA).



第30-3図 オホーツク海の海氷図（2001年11月15日）

Fig.30-3 Sea ice chart in the Sea of Okhotsk on 15 Nov. 2001.



第30-4図 オホーツク海の海氷域面積

Fig.30-4 Time-series of 5-day sea ice area in the Sea of Okhotsk.

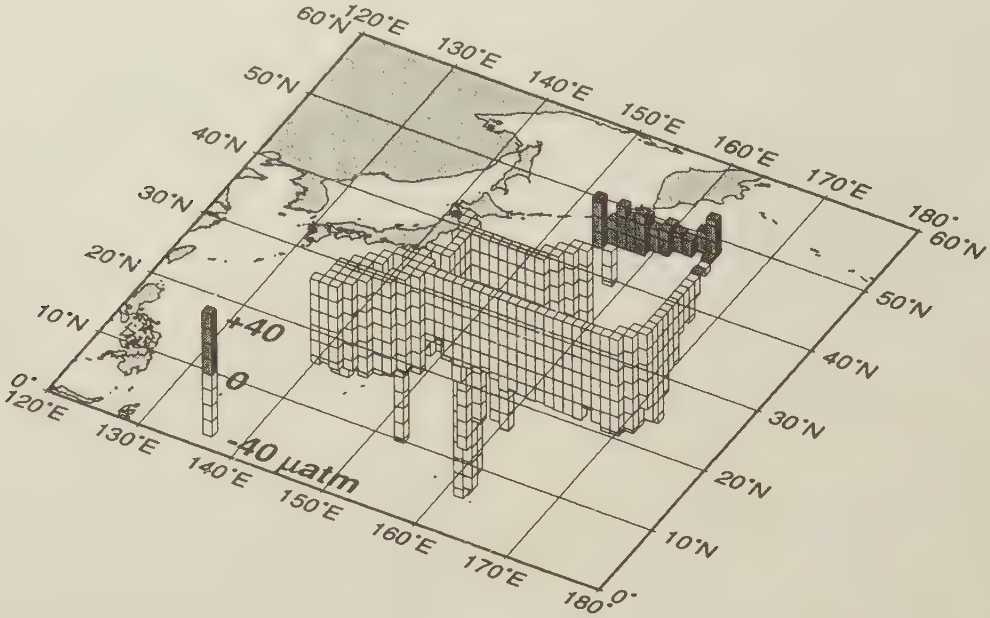
———— : current season (2001/2002)

———— : mean extent (1971–2000)

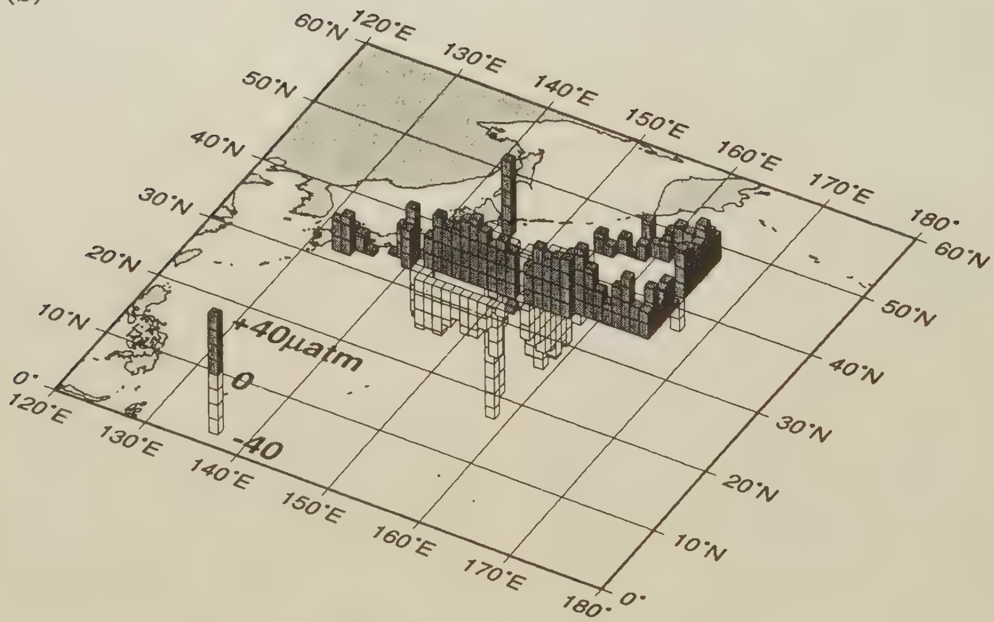
.... : maximum or minimum extent (1971–2001)

- - - - - - - - - : last season (2000/2001)

(a)

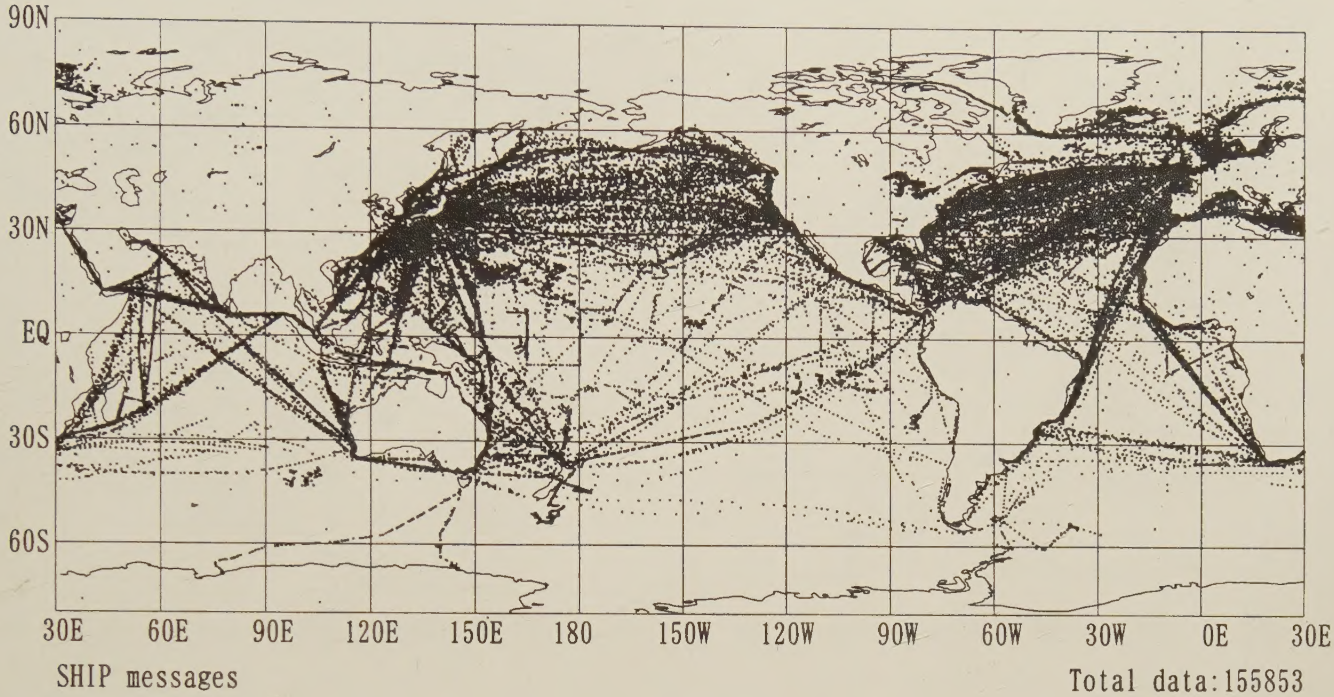


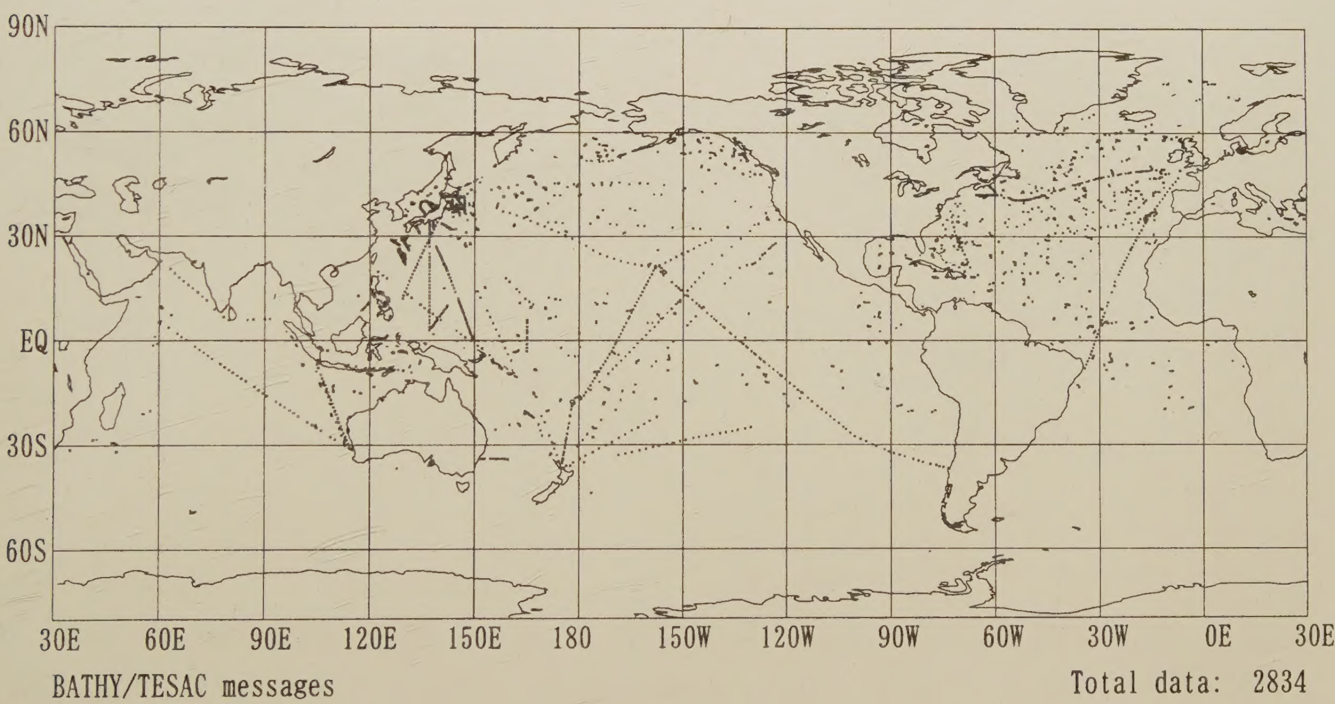
(b)



第 31 図　気象庁の海洋気象観測船「凌風丸」が、(a) 2001 年 4 月 24 日から 5 月 28 日にかけて、(b) 2001 年 6 月 19 日から 8 月 2 日にかけて北西太平洋で観測した洋上大気中と表面海水中の CO_2 の濃度差。棒グラフは、海洋から大気へ CO_2 を放出する場合を濃い陰影、及び海洋が大気の CO_2 を吸収する場合を薄い陰影に示してある。

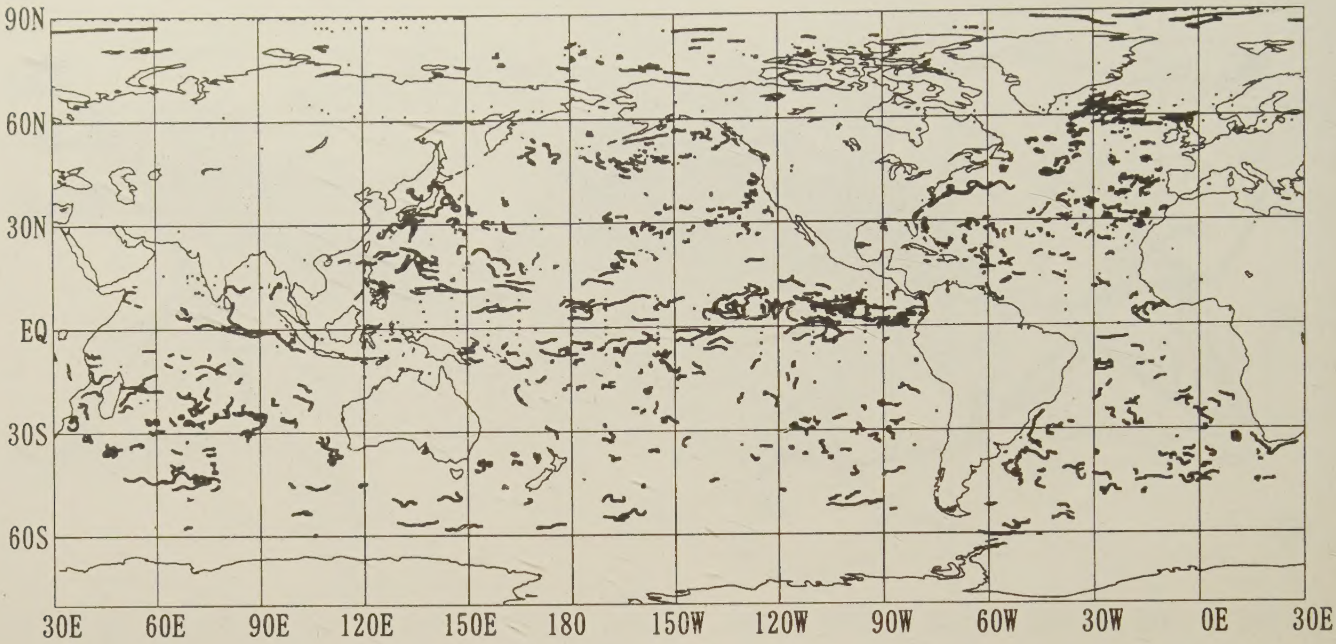
Fig. 31　Difference in the CO_2 concentration between the surface water and the overlying atmosphere in the western North Pacific observed by the R/V Ryofu Maru of JMA, (a) from April 24 to May 28, 2001, (b) from June 19 to August 2, 2001. Darker-shaded upward pillars indicate that the oceanic CO_2 was emitted into the atmosphere, and lighter-shaded downward pillars indicate that the atmospheric CO_2 into the ocean, respectively.



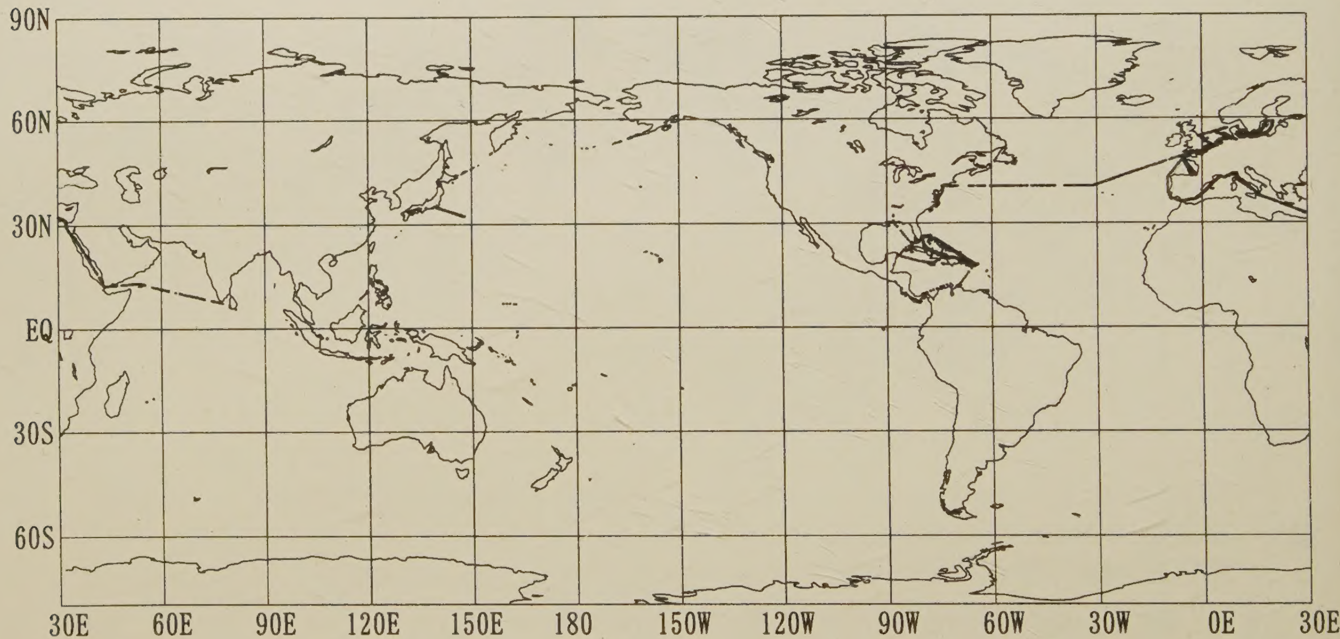


第32-1図　測点分布図(2001年11月)

Fig. 32-1 Geographical distribution of SHIP messages (SST data, top) and BATHY/TESAC messages (subsurface temperature data, bottom) for NOV 2001.



BUOY messages Total data:405432



TRACKOB messages Total data: 2244

第32-2図 測点分布図(2001年11月)

Fig. 32-2 Geographical distribution of BUOY messages (buoy drift and SST data, top) and TRACKOB messages (ship drift and SST data, bottom) for NOV 2001.

気象庁海洋月報

Monthly Ocean Report

November 2001 (No. 107)

本月報掲載の2001年11月のプロダクトには、気象庁が観測したデータ及びGTS（全球気象通信網）を通じて入手した国際気象通報式による通報のほか、下記の機関等から提供いただいたデータを使用しています。御礼申し上げます。

防衛庁、水産庁、海上保安庁

水産総合研究センター

海洋科学技術センター、（社）漁業情報サービスセンター

東北大学、東京大学、鹿児島大学

水産試験場等（北海道、青森県、岩手県、宮城県、秋田県、福島県、茨城県、千葉県、東京都、新潟県、富山県、静岡県、愛知県、三重県、兵庫県、和歌山県、鳥取県、徳島県、高知県、長崎県、宮崎県、沖縄県）

（順不同）

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